D Davies May 11-91

ARITHMETICAL QUESTIONS,

HAVING, FOR THE MOST PART,

A REFERENCE either to SACRED, PROFANE, or NATURAL HISTORY, CHRONOLOGY, GEOGRAPHY, or COMMERCE;

DESIGNED

As EXERCISES in the Four Principal RULES, and to anſwer the double Purpoſe of ARITHMETICAL INSTRUCTION, and MISCELLANEOUS INFORMATION; and intended as a SUPPLEMENT to the Author's Engraved Introduction to Arithmetic:

To which is added, a Collection of

Approved Tables of WEIGHTS and MEASURES.

FOR THE USE OF

YOUNG LADIES.

By WILLIAM BUTLER,

Private Teacher of WRITING, ACCOUNTS, and GEOGRAPHY.

"It is *every man's duty*, who comes into the world, to *uſe his beſt endeavours*, "*however inſignificant*, to leave it as much wiſer, and as much better as he can."

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BL

PREFACE.

IF the motto in the title page inculcates a general duty, it applies, with peculiar force, to perſons engaged in inſtruction by their profeſſion. Viewing the admonition in this obligatory light, I conſtantly endeavour to render the ſeveral parts of my profeſſional occupation as ſubſervient to the great end it aims to promote, as their nature will admit. Upon this plan the following queſtions have been compoſed, a few only excepted, which were deſignedly introduced from among thoſe in ordinary uſe, that the learner might not be unprovided with examples adapted to the common occurrences in buſineſs. The exerciſes now firſt publiſhed have, with ſeveral others of a ſimilar kind, been long diſtributed among the author's ſcholars; and he has often had the ſatisfaction of finding them ſignally inſtrumental in inſpiring a deſire of more extenſive and circumſtantial information. The hope of rendering the queſtions more generally uſeful, and the deſire of removing the toil of frequent tranſcription, were his motives for publication. In the mean time, he is aware that the accompliſhment of the former far more important view, depends greatly upon the teacher's exertions. Should this laſt, inheriting the apathy of Mrs. Shandy, eſteem it a matter of utter indifference "whether "the world turns round or ſtands ſtill;" he will, of courſe, benefit his pupils *juſt as much* by the common ſums, as by any that could be ſelected for him. But other inſtructors of more

animation and zeal, will occaſionally require minute accounts of the hiſtorical, chronological, and other ſubjects, which had before ſerved as arithmetical themes. They will, perhaps, with the author, deem the time when the ſcholars are aſſembled in claſſes to repeat their tables, the beſt ſuited for promoting general emulation, and diſſeminating the deſired knowledge among ſuch as are leſs diligent, or leſs advanced. It is, however, confeſſed that the method now propoſed, is impracticable in its *full extent*, except on the ſuppoſition that, during the maſter's abſence, the ſenior pupils have acceſs to books which treat more largely of the ſubjects recommended to their ſtudy. The mention of this circumſtance naturally leads me to advert to the great utility of a ſchool-library *(a)* for the uſe of thoſe ſcholars.

(a) The following, it is apprehended, will not be the leaſt valuable works of which the collection may conſiſt.

Engliſh and French claſſics. Females, ſays Mr. Knox, ſhould be well and early acquainted with the Engliſh and French claſſics: Milton, Addiſon, and Pope, muſt be ſtanding models in Engliſh; Boileau, Fenelon, Fontenelle, and Vertot, in French.

Approved hiſtories of England, Scotland, Greece, and Rome: Rollin's Ancient Hiſtory; Plutarch's Lives, by Langhorne; Biographical Dictionary, 12 vols. 8vo, laſt edition; good tranſlations of the Ancient Claſſics, ſo frequently and forcibly recommended to the peruſal of the Ladies, by the late Mr. Sheridan, in his Lectures; a good collection of ancient and modern maps; Dr. Rees's improved edition of Chambers's Dictionary. To the ineſtimable work juſt mentioned, which may be had at Mr. LONGMAN's, No. 39, Paternoſter-Row, complete, or in ſixpenny numbers, the author is principally indebted for the information contained in ſeveral of the following queſtions; and it will again be ſerviceable to him in a geographical performance intended for publication, in the courſe of the enſuing year.

In

In the beſt-regulated ſeminaries, vacant hours occur, many of which will be often waſted in the peruſal of pernicious, or at beſt, frivolous novels, if better books are not at hand. We are fully ſenſible with Mr. Knox, that, as a regular courſe of hiſtory would too much interfere with other parts of learning in the academies of young gentlemen, ſome of the time of recreation muſt be allotted to the attainment of that invaluable acquiſition. Females, in general, are exactly in the ſame predicament; and ſhould, therefore, be encouraged to devote a part of thoſe ſeaſons of relaxation to the acquiſition of a knowledge, which, however neceſſary and ornamental, the multiplicity of ordinary buſineſs renders unattainable at other times. It is hoped the following performance will not be thought altogether ill-calculated to facilitate the deſirable end juſt mentioned. Many of the queſtions in it either create ſome new idea, convey ſome uſeful or pleaſing information, or *fix the date* of ſome memorable tranſaction; a circumſtance deemed of ſuch conſequence by Mrs. Chapone, that ſhe obſerves, "it is to little purpoſe that you are able to "mention a fact, if you cannot nearly aſcertain the time in "which it happened, which alone, in many caſes, gives im-"portance to the fact itſelf." The ſame judicious writer elſewhere remarks, not inapplicably to the general deſign of the ſubſequent compilation, that "whatever tends to embelliſh the "underſtanding, and to furniſh the mind with ideas to reflect "upon when alone, or *to converſe upon in company*, is certainly "well worth the acquiſition."

The grand object of education is, however, to improve the heart, to repreſs irregular propenſities, and, in a word, to promote uſefulneſs here, and inſure happineſs hereafter: and what means can be deviſed ſo competent to the accompliſhment of thoſe great views, as that of impreſſing perſons, even of the tendereſt age, with an habitual and profound veneration for the

Sacred

Sacred Scriptures, which are divinely calculated to "make us "wiſe unto ſalvation *(b)*."

This will ſurely prove a full apology, if any be requiſite, for the Scripture queſtions introduced into the preſent tract. But let us direct our attention principally to female education, which judicious obſervers have repreſented as ſo eminently conducive to the welfare of a ſtate. Now, in order to eſtimate the high obligations women of cultivated minds may confer on the community, let us, firſt, reflect with Rouſſeau, that "the "education of moſt conſequence, is that which is received in "infancy; and this firſt education belongs *inconteſtibly* to the "WOMEN."

To ſelect a few examples, beginning with the ancient Roman matrons, among whom the economical virtues, particularly indefatigable induſtry in the cultivation of their offſprings minds, continued longeſt to flouriſh.———Cornelia, mother of the Gracchi; Aurelia, of Julius Cæſar; and Attia, of Auguſtus, ſuperintended the education of their reſpective children.

He of whom antiquity, ſanctioned by the teſtimony of an oracle, boaſts itſelf as of the wiſeſt of mortals, who is called by a modern author, "the Philoſophic Patriarch, and the divineſt "man, who had ever appeared in the heathen world," even SOCRATES himſelf, was indebted for much of his knowledge to Diotyma and Aſpaſia, women excellently learned. The latter is ſaid to have taught him rhetoric and politics.

(b) We muſt not omit the opportunity this incidental mention of the Bible gives us, to recommend to our youthful readers, that valuable writer, Mr. Knox's Select Chapters from the Old and New Teſtament, entitled Sacred Extracts, juſt publiſhed by Mr. Dilly.

Why,

Why, demanded a Perſian ambaſſador, are women held in ſuch high eſtimation at Lacedæmon? Becauſe, replied the conſort of Leonidas, they only are competent to form men. To a Greek lady who diſplayed her jewels before Phocion's mother, and expreſſed a deſire of ſeeing hers, the latter introduced her CHILDREN, ſaying, *Theſe are my dreſs and ornaments; I hope one day they will be all my glory.*

"Will," demands Mr. Knox, "the important buſineſs of "DRESSING and going to public places, prove ſo ſatisfactory "to mothers, a few years hence, as the conſciouſneſs of ha- "ving ſown the ſeeds of virtue, taſte, and learning, in the "infant boſoms of their own offspring?"

If, in the next place, we obſerve how greatly the conduct of men is influenced by the other ſex; what effectual diſcouragement their influence gives to *vice* and *ignorance* in their male relatives and acquaintance; "that" as the elegant writer juſt quoted pertinently obſerves, "the dignity of female virtue, "conſiſtently ſupported, is better calculated than any moral "leſſon, to ſtrike confuſion and awe into the breaſt of the "EMPTY and ARTFUL VILLAIN: and that they may indeed "become the BEST REFORMERS;" theſe, with other obvious conſiderations, will abundantly evince the ſingular advantages neceſſarily reſulting from female improvement.

Should any doubts ſtill remain of the very exalted benefits which we contend, naturally and of neceſſity flow from female influence, let an appeal be made to matter of fact, I mean to ancient and modern ſtory. To ſelect only two or three prominent and deciſive inſtances, out of the innumerable examples which the records of all nations ſupply in the utmoſt profuſion: who is ignorant of the patriotic ardor, the invincible intrepidity, inſpired by the truly *laconic* admonition of the Spartan matrons

matrons to their huſbands and ſons, when, after the laſt embrace that preceded an expected conflict, they charged them "to return either WITH OR UPON THEIR SHIELDS *(c)*." In Dr. Gordon's excellent Hiſtory of the American Revolution, what deciſive effects do we not frequently perceive reſulting from the exhortations of the DAUGHTERS OF LIBERTY on that continent to their near kindred and others, to extirpate tyranny, and plant independence in the ſoil which the baleful weed had ſo lawleſsly appropriated. Our own country affords paſſages equally animating. Its annals will, in the perſons of the queens Boadicia *(d)*, Matilda *(e)*, Philippa *(f)*, Margaret *(g)*, Elizabeth *(h)*, lady Arundel *(i)*, and many others, not only

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(c) It was the firſt and moſt inviolable law of war with the Spartans, never to flee, or turn their backs, whatever ſuperiority of numbers the enemy's army might conſiſt of; never to quit their poſt; *never to deliver up their arms*; in a word, either to conquer, or to die on the ſpot.—And ſometimes they that were ſlain were brought home *upon their ſhields*.

(d) Boadicia, a celebrated Britiſh heroine, who being defeated and ill uſed by the Romans, poiſoned herſelf, A. D. 61.

(e) Matilda defeated king Stephen, and took him priſoner at the battle of Lincoln, in 1141.

(f) Philippa, conſort of Edward III. commanded the army, which, at Durham, defeated the Scotch king, and made him priſoner, in 1346.

(g) Margaret of Anjou, wife of Henry VI. ſignalized herſelf, by heading her troops, in ſeveral battles, againſt the houſe of York.

(h) Every Hiſtory of England is enriched with Elizabeth's ſpeech to the troops which ſhe had encamped at Tilbury-Fort, to oppoſe the expected Spaniſh invaſion.

(i) This lady, in the civil wars, held out Wardour-Caſtle, with only 25 men, a whole week againſt the parliament forces, and at laſt ſurrendered upon honourable terms.

exemplify

exemplify how forcibly females have exhorted, but how magnanimouſly they have achieved. Of the ſame ſex's diſtinguiſhed ſucceſs in almoſt every department of ſtudy, even the moſt curſory notice is ſuperfluous, at leaſt in England, where we are all admiring witneſſes of the deep reflection, manly eloquence, refined ſentiment, and claſſic wit, which their productions ſeverally diſplay. What juſt appreciator, then, of our fair countrywomen's eminence in every literary, not to ſay ſcientific, purſuit, will charge the author with the introduction of many queſtions irrelative to female education? will cenſure him for having borrowed moſt of his themes from ſubjects in which, at this very day, ſo many adult ladies excel, rather than compoſing queſtions in the common *routine* way?

In the mean time, without expecting a formal defence of the propriety of every individual queſtion in this ſelection, the author is encouraged to hope that the candid and ſerious part of the public will approve of a deſign (however imperfectly it may have been executed) which has for its chief object a deſire to facilitate the path of ſcience, to allure the learner to mental exertions, and to impreſs an early veneration and love for civil and religious liberty, the proteſtant religion, and the Holy Scriptures; eſpecially as in the endeavours uſed to promote thoſe prime views, no new burthen has been impoſed on the learner, and no further encroachment made on his time, the information in queſtion being only incorporated with a branch of education in which *all* muſt be converſant.

In a compilation, as the preſent, in a great meaſure, confeſſedly is, and from its nature, indeed muſt be, the ſtile will naturally be various, becauſe, though it has ſometimes ſuſtained alteration, the ſeveral authors who ſupplied the materials are more frequently left to ſpeak for themſelves. Should, however, invidious diſingenuity affect to extend the charge of tranſcription from a conſiderable part to the whole of the

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undertaking, the author will readily conſole himſelf with Rollin's rational reflection, "Que m' importe d' ou il ſoit, "pourvû qu' il ſe trouve utile." If the things themſelves are good, it is not material whoſe they are.

The title announces the treatiſe to be deſigned for the uſe of young ladies, becauſe the author's department of teaching is *ſolely* confined to them. Perhaps, however, it may be held equally adapted to the other ſex, when it is conſidered that a youth, capable of working through the *whole* book, and of delivering a ſatisfactory account of each operation, would be qualified for almoſt any of the common concerns of buſineſs. Vulgar and decimal fractions, and the extraction of roots are of little utility, except in a few particular employments; and as to intereſt, profit and loſs, barter, fellowſhip, exchange, and ſome other rules which have diſtinct heads in the ordinary treatiſes of arithmetic, they all belong to the rule of three, and the queſtions in each may be worked with the greateſt facility, by any one well verſed in *that* and practice.

Sums given in words, in the manner here uſed, are greatly preferable to thoſe delivered in figures, or compoſed after the uſual manner, which ſeldom afford much exerciſe to the underſtanding. Accordingly, we frequently obſerve a ſcholar confuſed by a queſtion *exactly ſimilar* to thoſe he has often done, when it happens to be propoſed in words, or in a way to which he is not accuſtomed, or which may require ſome reflection.

The two books have been bound together, from a conviction that, united, they maybe uſed to more advantage; the ſums in the firſt part of the ſupplement being in general ſo eaſy, that the youngeſt pupils may be taught them from the beginning.

Laſtly,

Laſtly, it may not be unneceſſary to obſerve, that the generality of the queſtions being too long for the learner's tranſcription, they have all been numbered. Accordingly, the number, with a word or two of the ſum (for inſtance, No. 1, creation of the world; No. 2, the deluge) will be a ſufficient reference to the operation at large, at any future period. The pupil, however, ſhould by no means omit copying the whole proceſs of each ſum in a common ſum-book.

WILLIAM BUTLER.

Oxford-Court, Cannon-Street,
December 31, 1788.

ERRATA.

Queſtion 12, for Maranthon, read Marathon. Three of the queſtions numbered 48, ſhould be numbered 49, 50, 51. After the word year, in the N. B. queſtion 62, add, and no account is taken of the odd day. The anſwer to queſtion 85, ſhould be $17,857\frac{24}{168}$. In queſtion 87, for meridan, read meridian. The anſwer to queſtion 184, ſhould be 2,646 gallons, 10,584 quarts.

A future edition ſhall not only correct thoſe miſtakes, but reſpectfully and gratefully adopt ſuch further improvements, as known or unknown friends may condeſcend to communicate.

ARITHMETICAL QUESTIONS.

NUMERATION.

THE current year is 1788 from the birth of Chriſt.

The world is 5792 years old this preſent year.

The circumference of our earth is 25,020 miles, or 44,035,200 yards.

Mercury is ſaid to be about 37,000,000 of miles from the ſun; Venus 68,000,000; the Earth 95,000,000; Mars 145,000,000; Jupiter; 495,000,000 Saturn 908,000,000; and the Georgium Sidus about 1,800,000000 of miles diſtant from the ſun.

Mathematicians aſſert, that Syrius, or the Dog Star, is the neareſt to us of all the fixed ones; and they compute its diſtance from our earth at 2,200,000,000,000 of miles. They maintain that a ſound would not reach our earth from Syrius in 50,000 years; and that a cannon ball, flying with its uſual velocity of 480 miles an hour, would conſume 523,211 years in its paſſage thence to our globe. The fixed ſtars are ſuppoſed to be made for the ſame purpoſes as the ſun; that they may beſtow light, heat, and vegetation, on a certain number of inhabited planets.

The comet which appeared in 1680, travelled, when neareſt to the ſun, with the amazing velocity of 880,000,000 of miles in an hour. Its greateſt diſtance from the ſun is computed at 11,200,000,000 of miles, and its leaſt diſtance at 490,000, at which time it is ſaid to be 2000 times hotter than red hot iron.

ADDITION.

1. ACCORDING to moſt chronologers, the world was created 4004 years B. C. (*a*); how old is it this preſent year 1788? *Anſ.* 5792 years.

2. The inhabitants of our earth, except Noah and his family, were deſtroyed for their wickedneſs (*b*) by a flood in the year of the creation 1656, from thence to the birth of Chriſt was 2348 years; how long is it ſince the deluge happened this preſent year 1788? *Anſ.* 4136 years.

3. Abraham was called to be the father of a choſen people (*c*), in the year of the world 1921; how long has that event preceded the preſent year 1788, admitting the birth of Chriſt to have happened 2083 years after it? *Anſ.* 3871 years.

4. The iniquities of Sodom and Gomorrah, which were ſituated in a fertile plain, now occupied by the Dead Sea, in the Holy Land, occaſioned their ſubverſion by fire from heaven (*d*) 1897 years B. C. how long is that ago this preſent year 1788. *Anſ.* 3685 years.

5. Moſes, after performing a number of miracles in Egypt, quitted that kingdom with 600,000 Iſraelites, beſides children; they miraculouſly paſſed through the Red Sea (*e*) and came to the deſert of Sinai, where Moſes, the founder of the Jewiſh religion, received from GOD, and delivered to the people the Ten Commandments (*f*), and other laws. This happened 1491 years B. C. how long is that ago this preſent year 1788? *Anſ.* 3279 years.

6. Nebuchadnezzar, king of Babylon, took the city of Jeruſalem (*g*) by ſtorm, and made a terrible ſlaughter of the inhabitants. Zedekiah's two ſons were, by Nebuchadnezzar's orders, killed before their father's face, with all the nobles and principal men of Judah. Zedekiah himſelf had both his eyes put out, was loaded with fetters, and carried to Babylon,

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(*a*) B. C. denote before the Birth of Chriſt. (*b*) Gen. ch. vi. et ſeq.
(*c*) Gen. ch. xii. (*d*) Gen. xix. 24. (*e*) Exod. xiv. 21. et ſeq.
(*f*) Exod. ch. xx. et ſeq. (*g*) 2 Kings xxv. 1. et ſeq. Jer. xxxix. & lii.

where

where he died in priſon. The city and temple were pillaged and burnt, and all the fortifications demoliſhed 588 years B. C. how long is that ago this preſent year 1788. *Anſ.* 2376 years.

N. B. It was in the reign of Nebuchadnezzar that the three young Hebrews Shadrach, Meſhach, and Abednego, who with an invincible courage refuſed to comply with the king's impious commands reſpecting the worſhip of the golden image, were miraculouſly preſerved in the midſt of the burning fiery furnace (*h*). Great numbers of the Jews had been carried captive to Babylon ſome years before the deſtruction of Jeruſalem (*i*). Among the captives were Daniel and Ezekiel.

7. The taking of Babylon is one of the greateſt events in ancient hiſtory, and the principal circumſtances with which it was attended, were long before minutely foretold in the Holy Scriptures. The pious Rollin, in his hiſtory of Cyrus (*k*), has remarked on this occaſion, "that "nothing can be more proper to raiſe a profound reverence in us for "religion, and to give us a great idea of the *Deity*, than to obſerve with "what exactneſs he reveals to his prophets the principal circumſtances "of the beſieging and taking of this famous city, not only many years, "but ſeveral ages before it happened." The cauſes of *God's* wrath againſt Babylon were 1. Her inſupportable pride: 2. Her inhuman cruelty to the Jews: and 3. The ſacrilegious impiety of her king Belſhazzar. The predictions reſpecting the total ruin and deſtruction of Babylon may be read in the writings of Iſaiah, Jeremiah, and Daniel, whoſe denunciations were executed upon this city by Cyrus, 538 years B. C. juſt 50 years after ſhe had deſtroyed the city of Jeruſalem and her temple; how long is that ago this preſent year 1788. *Anſ.* 2326 years.

8. The war between the Greeks and Trojans, which continued ten years, was occaſioned by Paris, the ſon of Priam, king of Troy, running away with Helen, the beautiful wife of Menelaus, king of Sparta. The deſtruction of Troy, which was ſituated in Aſia, near the N. E. part of the Archipelago, happened 1184 years B. C. how long is that ago this preſent year 1788? *Anſ.* 2972 years.

N. B. The misfortunes of Troy have furniſhed the ſubject of the two moſt perfect Epic poems in the world, namely the Iliad and the Odiſſey,

(*h*) Dan. chap. iii. (*i*) 2 Kings xxiv. 10. et ſeq. (*k*) Ancient Hiſt. Vol. II.

written by Homer, a celebrated Greek, who flouriſhed about 340 years after the ſiege, and is commonly accounted a native of Smyrna.

The ſubject of the Iliad is the wrath of Achilles, which proved ſo fatal to the Greeks, when beſieging Troy. The Odiſſey recounts the voyages and adventures of Ulyſſes, after the ſacking of that city. The ſame intereſting ſtory has likewiſe ſupplied ſome of the moſt ſplendid materials for Virgil's very animated poem of the Æneid, written in honour of Æneas.

Homer, Virgil, and our Milton, are conſidered as the three greateſt poets that ever lived.

9. The celebrated Temple of Diana, at Epheſus, one of the wonders of the world, was built at the common charge of all the ſtates of Aſia. Pliny ſays 220, others aſſert 400 years were employed in completing this ſtupendous ſtructure, which was conſumed the night of the great Alexander's nativity, viz. 356 years B. C. by one Eroſtratus, who confeſſed on the rack, that the ſole motive which had prompted him to deſtroy ſo magnificent an edifice, was the deſire of tranſmitting his name to future ages. How many years have elapſed ſince that event to the preſent year 1788? *Anſ.* 2144.

N. B. The wonders of the world, popularly ſo called, were the Egyptian pyramids; the mauſoleum erected by Artemiſia for her huſband Mauſolus; the temple of Diana; the coloſſus at Rhodes; the walls and hanging gardens of Babylon; the ſtatue of Jupiter Olympus; and the pharos of Ptolemy Philadelphus. Inſtead of two of theſe ſome reckon the palace of Cyrus, and the labyrinth of Crete.

10. The unfortunate Saguntum was ſituated on the ſpot where Morviedro in Valencia, Spain, now ſtands. This brave city is famous in hiſtory for the dreadful ſiege it ſuſtained 219 years B. C. when the heroic citizens, after exerting incredible acts of valour, choſe to be buried in the ruins of their city rather than ſurrender to Hannibal, the famous Carthaginian general. How long has that tragical event preceded the preſent year 1788? *Anſ.* 2007 years.

11. Numantia was ſituated near Soria in New Caſtile, Spain. Scipio Africanus beſieged this famous city 133 years B. C. when the magnanimous inhabitants, after a long conflict againſt the extremity of famine and the deſpair of ſuccour, ſignalized their love of liberty by ſetting fire

to

to their houſes, and periſhing in the flames. How long has that heroic event preceded the preſent year 1788? *Anſ.* 1921 years.

12. The Athenians, with only 10,000 men, commanded by Miltiades, defeated Datis at the head of 100,000 Perſian infantry, and 10,000 horſe, on the plains of Maranthon, in Livadia, Turkey in Europe, 490 years B. C. How long is that ago this preſent year 1788? *Anſ.* 2278 years.

13. The Lacedemonians loſt the battle fought by them againſt the Thebans at Leuctra, and, with it, the dominion of Greece, 371 years B. C. How many years have intervened between that period and the preſent year 1788? *Anſ.* 2159.

14. The renowned Theban general Epaminondas was ſlain at the battle of Mantinea in Arcadia, 361 years B. C. but did not expire until he learnt that his troops were every where victorious. How many years have elapſed ſince that illuſtrious hero's death this preſent year 1788? *Anſ.* 2149.

15. Alexander the Great, king of Macedonia, croſſed the Granicus, a river of Cilicia in Aſia, which ran into the Propontis, or Sea of Marmora, at the Head of 30,000 Macedonians, in the face of the Perſian army, 600,000 ſtrong. On his gaining the ſhore, the Perſians were immediately routed. This happened 334 years B. C. how many years have ſucceeded that event this preſent year 1788? *Anſ.* 2122 years.

16. Alexander defeated Darius, king of Perſia, at Iſſus, now called Ajazzo, ſituated weſt of Aleppo. In this important battle 100,000 Perſians were ſlain, and the tent of Darius taken, in which were his mother, wife, two daughters, and young ſon. This event took place 333 years B. C. how long is that ago this preſent year 1788. *Anſ.* 2121 years.

N. B. The famous battle of Arbela, a town ſituated about 140 miles N. of Bagdat, was fought between Alexander and Darius ſome time after the one juſt noticed, and it determined the fate of the Perſian empire. The three laſt-mentioned conflicts, together with that which the ſame monarch afterwards had with Porus on the banks of the river Hydaſpes, now called the Indus, are denominated the *four* battles of Alexander, which have been the ſubject of the pencil, graver, &c. Alexander was

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the founder of the Macedonian empire, one of the four great monarchies, and for his rapid and extenſive conqueſts is ſtyled the Conqueror of the World. The other three celebrated ancient monarchies were the Aſſyrian, the Perſian, and the Roman.

17. The defeat and death of Brutus and Caſſius, at Philippi, in Macedonia, where theſe ſtrenuous and virtuous republicans engaged the Cæſarean party commanded by Octavius Cæſar and Mark Anthony, put a final period to popular government at Rome, 42 years B. C. How long did that event precede the preſent year 1788? *Anſ.* 1830 years.

18. The navy of Octavianus, afterwards Auguſtus Cæſar, obtained a deciſive victory over the conjoined fleets of Mark Anthony and Cleopatra, near Actium, a ſmall city on the Ambracian gulph, N. of the iſland of Cephalonia, Turkey in Europe. This event happened 31 years B. C. How many years have intervened between that period and the preſent year 1788? *Anſ.* 1819.

19. Julius Cæſar, the famous Roman general and hiſtorian, invaded this country 54 years B. C. Having ſubdued Pompey, the great rival of his growing power, and purſuing his favorite maxim, "That he had rather "be the firſt man in a village, than the ſecond in Rome," he aimed at the imperial dignity; in conſequence of which the friends of the civil liberty of the republic aſſaſſinated him in the ſenate-houſe, 12 years after his invaſion of Britain. How many years is it ſince that event took place to the preſent year 1788. *Anſ.* 1830.

20. The year 146 B. C. is memorable for the deſtruction of the two celebrated cities of Carthage and Corinth. The former was ſituated about 30 miles N. W. of Tunis in Africa, and, for a long time, diſputed the empire of the world with Rome; but was at length deſtroyed by Publius Emilianus Scipio (who having been adopted by Scipio Africanus, is frequently ſtyled Scipio Africanus, jun.) after a war of three years, which was called the third Punic* war. The conduct of the wife of Aſdrubal, the

* The wars between the Romans and Carthaginians were called *Punic*; a word ſaid by ſome to be derived from *pæni*, an antiquated Latin term ſignifying falſe, faithleſs perſons; the latter people being, at all times, noted for breach of faith. Be this etymology, however, well or ill founded, *Punica fides*,

the Carthaginian commander, on this occaſion is worthy of narration. After upbraiding the perfidious wretch, her huſband, with delivering himſelf up to the Romans, ſhe ſeized her children, ſlew them, caſt them into the flames of Eſculapius's temple, which the Roman deſerters, deſpairing of pardon, had ſet on fire, and immediately ruſhed into the ſame conflagration, where ſhe periſhed. How many years did that city's cataſtrophe precede the preſent year 1788? *Anſ.* 1934.

21. Xanthus was the metropolis of Lycia, a diſtrict of Aſia Minor, ſomewhat N. E. of the iſland of Rhodes. The inhabitants of this once famous city have acquired great celebrity in ancient hiſtory, like thoſe of Saguntum and Numantia, and on a ſimilar account; a renown which time ſhall not obſcure, while the love of freedom is eſteemed an elevated and virtuous affection. Theſe brave people, when Brutus became maſter of their place, 42 years B. C. being determined not to ſurvive the loſs of liberty, deſtroyed their wives and children, ſet their city on fire, and periſhed in the conflagration, as their anceſtors had before done, rather than ſubmit to Harpagus, Cyrus's lieutenant, or to the great Alexander, conqueror of Aſia. How long did the deſtruction of Xanthus precede the year 1788. *Anſ.* 1830 years.

N. B. Plutarch recounts this tranſaction more at large in his life of Brutus.

22. At Pharſalia, in Theſſaly, now Janna, a province of European Turkey, was fought 48 years B. C. the great and deciſive battle between Pompey and Cæſar. The iſſue proved fatal to the former commander, who, after a total defeat, fled to Egypt, where he was treacherouſly ſlain, and his head ſhortly after preſented to his rival. How long is that ago this preſent year 1788; *Anſ.* 1836 years.

23. A perſon owes to A £100, to B £240 10*s.* to C £784 12*s.* 6*d.* to D £500, to E £25 4*s.* 7*d.* and to F £19 19*s.* 6*d.* what do his debts amount to? *Anſ.* £1670 6*s.* 7*d.*

24. A man borrowed a certain ſum of money, and paid in part £648 18*s.* 4*d.* the ſum left unpaid was £769 17*s.* 8*d.* what was the original debt? *Anſ.* £1418 16*s.*

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fides, or Carthaginian integrity, became, *after the middle age of the Roman ſtate*, a proverbial irony to denote fraud and perfidy.

25. Laid

25. Laid out in beef 14*s.* 10*d.* ½. in mutton 7*s.* 4*d.* ¾. in veal 8*s.* 10*d.* ¾ in lamb 5*s.* 4*d.* ½. in vegetables 1*s.* 9*d.* ¾. in butter 1*s.* 4*d.* ½. what was expended in all? *Anſ.* £1 19*s.* 8*d.* ¼.

26. Paid a baker's bill of £2 12*s.* 6*d.* a butcher's of £8 7*s.* 6*d.* a cheeſemonger's of 18*s.* 9*d.* a milliner's of £5 18*s.* a mantua-maker's of £2 14*s.* 8*d.* and a hair-dreſſer's of £5 10*s.* what is the amount of the ſeveral ſums? *Anſ.* £26 1*s.* 5*d.*

27. Expended in gloves 14*s.* 8*d.* in gauze £1 3*s.* 7*d.* in ribands 2*s.* 6*d.* in ſtockings 16*s.* in lace £4 10*s.* in cambric £2 12*s.* 6*d.* in muſlin £3 4*s.* and in ſilk £5 12*s.* what was the whole ſum ſpent? *Anſ.* £18 15*s.* 3*d.*

28. Bought 6 yards of mode, at 6*s.* 4*d.* per yard; 6 yards of lining, at 3*s.* 2*d.* per yard; 9 yards of lace, at 4*s.* 10*d.* per yard, and paid for making the cloak 2*s.* 6*d.* what is the amount of the whole? *Anſ.* £5 3*s.*

29. St. Paul's cathedral coſt £800,000; the Royal-Exchange £80,000; the manſion-houſe £40,000; Black-Friar's-Bridge £152,840; Weſtminſter-Bridge £389,000; and the monument £13,000; what is the amount of theſe ſums? *Anſ.* £1,474,840.

30. The neceſſary increaſe of the ſums coined, is conſidered by political writers, as a certain proof of the increaſe of our national commerce. By George I. £8,725,921 ſterling were coined. In the long reign of George II. £11,966,576; and in the firſt 24 years of his preſent majeſty's reign, the ſums coined amounted to £33,089,274 ſterling; what is the amount of theſe ſums? *Anſ.* £53,781,771.

31. Pearls are moſt frequently found in the pearl-oyſter, which is three or four times the ſize of the common oyſter. The principal pearl fiſheries are in the Perſian gulph; in the iſland of Ceylon; and in the gulph of Mexico. Some pearls are of immenſe value; that of the celebrated Cleopatra was eſtimated at £80,000 ſterling; that brought to Philip II. in 1574, at £32,400; and one in the hands of the emperor of Perſia is ſaid to have been purchaſed for a ſum equal to £110,400 ſterling; what is the value of theſe three gems? *Anſ.* £222,800.

SUBTRACTION.

32. THE deſtruction of Jeruſalem by Nebuchadnezzar has been noticed in the 6th queſtion. In the year 536 B. C. Cyrus king of Perſia publiſhed the famous edict (*l*) which permitted the return of the Jews to Jeruſalem. This edict is ſuppoſed to have been obtained by the earneſt ſolicitations of Daniel, who enjoyed great credit and authority at court. Cyrus had been mentioned by Iſaiah (*m*) 200 years before his birth, as the perſon appointed by God for the deliverer of the captive Jews, by ordering the rebuilding of their temple, and their own reſtoration to Jeruſalem and Judea. Shortly after the emiſſion of this edict, the Jews departed, and began to rebuild their temple and city. After having completed theſe important undertakings, and ſuſtained various diſaſters from the Egyptians, Syrians, and Romans, Jeruſalem was at length finally deſtroyed by the latter people under Titus, the ſon of Veſpaſian, who not only levelled the buildings to the ground, but even entirely razed the city with the plough; ſo that, in conformity to our Saviour's prediction (*n*), not one ſtone remained upon another. The numbers who periſhed in this ſiege, amounted, according to Joſephus the Jewiſh hiſtorian, to above 1,000,000, and the captives to almoſt 100,000. The temporal ſtate of the Jews ended with their city; immediately after whoſe ſubverſion, the wretched ſurvivors were baniſhed, ſold, and diſperſed into all parts of the world, where they continue to this day a "ſtanding miracle" in favour of the truth of our holy religion. This event occurred A. D. 70; how long is that ago, this preſent year 1788? *Anſ.* 1718 years.

33. Epocha, in chronology, is a term or fixed point of time, whence ſucceeding years are numbered or accounted. That principally regarded among Chriſtians is the epocha of the nativity of our Saviour; that of the Mahometans the hegira; that of the Jews the creation of the world; that of the ancient Greeks the olympiads; that of the Romans the building of the city; and that of the ancient Perſians and Aſſyrians the epocha of Nabonaſſar, king of Babylon, its inſtituter, 746 years B. C. The building of Rome took place 753 years B. C. The olympics or olympic games,

(*l*) Ezra, Chap. i. (*m*) Chap. xliv. 28. xlv. 1 & 13.
(*n*) Matt. xxiv. 2. Luke xix. 41—44. Chap. xxi. 6 & 24.

ſo famous among the Greeks, were inſtituted in honour of Jupiter. They were held at the beginning of every fifth year, on the banks of the Alpheus, near Olympia, to exerciſe their youth in 5 kinds of combats. Thoſe who were conquerors in them were highly honoured by their countrymen. The prize contended for was a crown made of a peculiar ſort of wild olive appropriated to this uſe. The olympiads ended with the year of Chriſt 440, making in all 364. The hegira, or flight of the impoſtor Mahomet, the founder of the Mahometan religion, from Mecca to Medina, happened A. D. 622; what is the preſent Mahometan year in 1788? *Anſ.* 1166.

N. B. A. D. denote Anno Domini; in the year of our Lord.
A. M. Anno Mundi; the year of the world.
A. C. Ante Chriſtum; before Chriſt.
U. C. Urbe condita (ab, from, being underſtood) the building of the city, *i. e.* of Rome.

34. William, duke of Normandy, commonly called the Conqueror, invaded England A. D. 1066, and defeated Harold, the reigning prince, at the battle of Haſtings in Suſſex. In this famous engagement, which laſted from morning till ſun-ſet, there fell 15,000 Normans, and the loſs on the ſide of the vanquiſhed was yet more conſiderable, beſide that of the king and his two brothers. William had three horſes ſlain under him. This victory put an end to the Saxon monarchy in England, which had continued for more than 600 years. How many years have elapſed ſince that event to the preſent year 1788? *Anſ.* 722.

35. The cruſades, or holy wars, were undertaken by the Chriſtian powers to expel the Turks from Jeruſalem and the adjacent countries, called the Holy Land. They were projected by Peter, an enthuſiaſtic hermit, and patronized by pope Urban II. who convened a council of 310 biſhops at Clermont in France, A. D. 1094, at which the ambaſſadors of the chief Chriſtian potentates aſſiſted and reſolved to execute this iniquitous plan. How long is that ago this preſent year 1788? *Anſ.* 694 years.

36. Ireland was formerly divided among a number of petty ſovereigns; a circumſtance which facilitated Henry the Second's conqueſt of that valuable iſland, in 1172, when it became an appendage to the Engliſh crown. How long is that revolution anterior to the preſent year 1788? *Anſ.* 616 years.

37. The

37. The battle of Aſcalon in Judea was fought A. D. 1192, in which Richard I. king of England, defeated an army of 300,000 men commanded by Saladin the famous ſultan of Egypt, againſt whom the European potentates waged the moſt unjuſt wars, under the falſe appellation of holy ones. How many years have elapſed ſince that tranſaction, this preſent year 1788? *Anſ.* 596.

N. B. Richard after gaining many victories in the Holy Land, returned home through Germany, where he was ſeized by Leopold, duke of Auſtria, and ſent to the emperor, who detained him, until aſſured of receiving 150,000 marks for his ranſom.

38. Runnamede, a place between Staines and Windſor, is held in reverence by poſterity, as the ſpot where the ſtandard of freedom was firſt erected in England. There the barons, in the year 1215, compelled the tyrannical monſter king John, to ſign the famous charter, which is now, by way of pre-eminence, called MAGNA CHARTA, and is juſtly eſteemed the bulwark of Engliſh LIBERTY. How long has that glorious event preceded the year 1788? *Anſ.* 573 years.

39. Richard I. of England, defeated the French at Giſors in Normandy, France, A. D. 1198. That monarch's parole for the day was "*Dieu et mon droit, God and my right,*" which has almoſt ever ſince continued the motto of the royal arms of England. How many years have intervened between that victory and the preſent year 1788? *Anſ.* 590.

N. B. King William III. uſed the motto *Je maintiendray*; though he commanded the former to be retained on the great ſeal. The ſame is to be underſtood of the late queen Anne, who uſed the motto, *Semper eadem*; which had been before adopted by queen Elizabeth.

40. When the Saxons made themſelves maſters of South-Britain, moſt of the ancient Britons retired to Wales, where they defended themſelves with the utmoſt bravery againſt the bold invaders; they afterwards made many vigorous attempts to maintain their liberties againſt the encroachments of the kings of England. Edward I. however, ſubdued the whole country, and annexed it to the crown of England. Perceiving that the Welſh were not entirely reconciled to this revolution, he ſent his queen to be delivered in Caernarvon caſtle. There ſhe happened to be brought to bed of a ſon, whom Edward very politicly ſtyled prince of Wales; which title the heir to the crown of Great-Britian has borne almoſt ever ſince. The unfortunate Edward II. the firſt prince of Wales,

was born in 1284. How long is that ago this preſent year 1788? *Anſ.* 504 years.

N. B. Previous to Henry VIII's having male iſſue, he created his daughter Mary, princeſs of Wales.

The revenue accruing to the prince of Wales, from his principality, is computed at about £8000 a year.

41. The three oſtrich feathers with the motto "*Ich Dien*," which in the German language, ſignifies "*I ſerve*," were added to the arms of the prince of Wales in 1346, after the famous battle of Creſſy in Picardy, France, where Edward the black prince, ſon of Edward III. having killed John, king of Bohemia, who, though blind, ſerved as a volunteer in the French army, took from his head ſuch a plume, and put it on his own; and this was judged a proper emblem to perpetuate the memory of that glorious victory. It has accordingly been ever ſince adopted by the heirs to the crown of England. How long have the ſeveral princes of Wales worn that diſtinguiſhed badge of honour, this preſent year 1788? *Anſ.* 442 years.

42. Poictiers is ſituated about 70 miles N. E. of Rochelle, in France; there Edward the black prince, ſon of Edward III. obtained a deciſive victory over the French in 1356, and made John, king of France and his ſon Philip priſoners, whom he brought to England, where David Bruce, king of Scotland, was a captive at the ſame time. How many years have elapſed this preſent year 1788 ſince that famous battle? *Anſ.* 432.

43. Agincourt, a village of Artois, in the French Netherlands, is famous in our annals as the place where Henry V. defeated the French in 1415. His priſoners on that occaſion were ſo numerous, that he was obliged to kill them. How long is that ago this preſent year 1788? *Anſ.* 373 years.

44. Towton, a place ſituated S. E. of Tadcaſter, in Yorkſhire, is noted for an engagement between the forces of the houſes of York and Lancaſter. This famous battle is ſuppoſed to have been one of the moſt bloody that ever happened in any civil war. Both armies conſiſted of 100,000 men, near 40,000 of whom lay dead on the field of battle. After prodigies of valour had been performed on both ſides, victory remained with

with the Yorkiſts. This happened in 1461; how long is that ago this preſent year 1788? *Anſ.* 327 years.

N. B. The other principal battles which were fought during the fatal conteſts of the Yorkiſts and Lancaſtrians were thoſe of St. Albans, Northampton, Wakefield, Hexham, Mortimer's-Croſs near Ludlow, Barnet, and Tewkſbury.

Theſe unhappy feuds originated with the deſcendants of Edward III. That monarch was ſucceeded by his grandſon Richard II. who being depoſed, the duke of Lancaſter was proclaimed king by the title of Henry IV. in prejudice to the duke of York, the right heir to the crown; he being deſcended from Lionel the ſecond ſon of Edward III. whereas the duke of Lancaſter was the ſon of John of Gaunt, the third ſon of king Edward. The acceſſion of Henry IV. to the throne occaſioned ſeveral conſpiracies, and the famous battle of Shrewſbury, during his reign; and the animoſities which ſubſiſted between his deſcendants and thoſe of the duke of York, afterwards filled the kingdom with civil commotions, and deluged its plains with blood, particularly in the reigns of Henry VI. and Edward IV.

The enſign of the houſe of York was a white roſe, that of Lancaſter a red, and this gave name to the two factions.

45. The art of printing, at leaſt in Europe, is a modern diſcovery, and who were the firſt inventors of European printing, in what city, and what year, it was at firſt ſet on foot, is a famous problem long diſputed among the learned. In effect, as the Grecian cities contended for the birth of Homer, ſo do the German cities for that of printing. Mentz, Haerlem, and Straſburgh, are the warmeſt on this point of honour: the firſt has always had the majority of voices; but the queſtion, in reality, is not yet juſtly decided. Mentel of Straſburgh, Guttenberg and Fauſt of Mentz, and Coſter of Haerlem, are the perſons to whom this honour is ſeverally aſcribed by their reſpective countrymen; and they have all their advocates among the learned. The introduction of this invaluable art into this kingdom is univerſally aſcribed to Caxton, a merchant of London, who had acquired a knowledge of it in his travels abroad. This occurred in the year 1471, how long is that ago this preſent year 1788? *Anſ.* 317 years.

46. Boſworth-Field, Leiceſterſhire, is famous in our annals for the defeat and death of the tyrant Richard III. in the year 1485, when his antagoniſt, Henry, earl of Richmond, was immediately proclaimed king, by

by the ſtyle of Henry VII. Thus ended the bloody reign of Richard; and by his death the race of plantagenet kings, who had been in poſſeſſion of the crown during the ſpace of 330 years, became extinct. Thus ended alſo the conteſts between the houſes of York and Lancaſter, by which moſt of the ancient families of the kingdom were extinguiſhed, and more than 100,000 men loſt their lives, either by the ſword or the executioner. How long has the death of Richard III. preceded the preſent year 1788? *Anſ.* 303 years.

N. B. The intereſts of the houſes of York and Lancaſter were blended by the marriage of Henry VII. and princeſs Elizabeth, daughter of Edward IV.

47. The name PROTESTANT originated in Germany; and the followers of Luther's doctrine were ſo diſtinguiſhed, becauſe, in 1529 they formally *proteſted* as well againſt the condemnatory decree of the emperor Charles V. as againſt the ſimilar one at Spires, making an appeal from both ſentences to a general council. The appellation has ſince been ſometimes reſtricted to thoſe who held the tenets of Calvin: but of late it is become the general denomination of ſects of every deſcription, who, continuing to profeſs the Chriſtian religion, have revolted from the faith and ſupremacy of the Roman ſee. How long has the term proteſtant been in uſe this preſent year 1788? *Anſ.* 259 years.

48. The reformation of religion, called, by way of eminence, THE REFORMATION, was begun by the elector of Saxony at the ſolicitation of Luther about the beginning of the 16th century. The ſame corruptions in the church of Rome which Luther condemned, had, however, been attacked long before his appearance, and the ſame opinions which he propagated, had been publiſhed in different places and ſupported by the ſame arguments. Among the moſt ſucceſsful reformers our countryman Dr. John Wickliffe, holds a diſtinguiſhed rank; having the honour of being the father of the reformation of the Engliſh church from popery, and, as ſome aſſert, the firſt perſon in Europe who boldly oppoſed the popiſh ſuperſtitions. This great man began to ſpread his doctrines in the latter end of Edward III's reign, and died in 1382. That form of religious doctrine and eccleſiaſtical government, which at preſent ſubſiſts in England, was eſtabliſhed in the year 1558, in the reign of queen Elizabeth. How long is that ago this preſent year 1788? *Anſ.* 230 years.

N. B.

N. B. Waldus, Wickliffe, Huſs, Jerome of Prague, Zuingle, Luther, Calvin, and Knox, were the moſt celebrated reformers.

48. The Pariſian maſſacre was carried on with ſuch deteſtable perfidy, and executed with ſuch a bloody cruelty, as would ſurpaſs all belief, were it not atteſted with the moſt undeniable evidence. In the year 1572, in the reign of Charles IX. many of the principal proteſtants were invited to Paris, under a SOLEMN OATH of ſafety, upon occaſion of the marriage of the king of Navarre, the head of the proteſtant party, with the French king's ſiſter. Though doomed to deſtruction, they were received with careſſes, loaded with honours, and treated, for ſeven months, with every poſſible mark of familiarity and confidence. In the midſt of their ſecurity, the warrant for their deſtruction was iſſued by their ſovereign, on whoſe word they had relied; and in obedience to it, their countrymen, their fellow-citizens and companions, imbrued their hands in their blood. This horrid butchery began on the 24th of Auguſt, being Bartholomew's day, on which, and the two ſucceeding days, above 10,000 proteſtants without diſtinction of age, or ſex, or condition, were murdered in Paris alone. A butcher boaſted to the king that he had hewn down 150 in one night, and De Thou, a celebrated French hiſtorian, affirms, that he had often, with the utmoſt horror, ſeen a goldſmith named Crucé, who boaſted of having killed 400 with his own hands. A like carnage enſued in the provinces, where upwards of 25,000 more were deſtroyed by thoſe blood-thirſty miſcreants. This horrid deed was applauded in Spain; at Rome, ſolemn thankſgivings were offered to God for its ſucceſs; and medals were ſtruck at Paris in honour of it. Behold here, benevolent reader, the true portraiture of POPERY! How long has this unparalleled enormity preceded the preſent year 1788? *Anſ.* 216 years.

N. B. The ſpirit of French popiſh cruelty abated nothing of its rigour in latter ages; for when Lewis XIV. in 1685, repealed the edict of Nantz, which allowed the proteſtants the free uſe of their religion, he expelled 150,000 of them out of his kingdom, dragooned others into popery, ſent many for ſlaves, chained them in his galleys, and ſpared no violence to oppreſs and deſtroy them. It muſt, however, afford ſingular pleaſure to every well-wiſher to the proteſtant cauſe, and the rights of humanity, to find that the royal edict given at Verſailles in November 1787, grants toleration throughout the French king's dominions, to diſſenters from the eſtabliſhed church.

In

In England, likewiſe, the proteſtants have had a ſhare in the cruelties practiſed by the Romiſh clergy and church. For upon queen Mary's coming to the crown in 1553 all the ſanguinary penal laws were revived; and in the ſpace of 5 years and 4 months, which that bloody bigot reigned, there were burnt and roaſted for their religion, 5 biſhops, 21 divines, 8 gentlemen, 84 artificers, 100 huſbandmen, ſervants, and labourers, 26 wives, 20 widows, 9 virgins, 2 boys, and 2 infants; 16 periſhed in goals, and 12 were buried in dunghills. Others affirm that 800 were put to death in that diabolical perſecution.

48. The truly formidable armament equipped by Philip II. king of Spain, by the inſtigation of pope Innocent VIII. for the conqueſt of England, and which was arrogantly, and, as the iſſue proved, ſottiſhly diſtinguiſhed by the epithet "invincible," was defeated in the reign of queen Elizabeth, A. D. 1588, by admiral Howard, with the co-operation of Sir Francis Drake, and other able and gallant officers. How many years ſince that memorable victory to the current year 1788? *Anſ.* 200.

N. B. Although our officers and ſeamen highly deſerved every encomium that has been beſtowed on them for their valiant conduct on that occaſion; yet it ſhould be remembered with gratitude by poſterity, that the elements alſo conſpired to fruſtrate the infernal views of our popiſh enemies. Queen Elizabeth was ſo ſenſible of this ſignal interpoſition of Providence in her favour, that in the reverſe of a medal which was ſtruck to perpetuate the memory of the extraordinary event, ſhe cauſed a fleet to be repreſented beaten by a tempeſt, and falling foul upon one another, with that religious inſcription, "*Afflavit Deus, et diſſipantur.*" "He blew with his wind and they were ſcattered."

See Spect. Vol. IV. No. 293.

49. In the reign of James I. A. D. 1605, was happily diſcovered the plot which ſeveral Roman catholics had formed to blow up the parliament-houſe, while the king, lords, and commons were aſſembled there. Guy Fawkes, the abandoned villain who had undertaken the department of ſetting fire to the train of gunpowder laid for that purpoſe, was executed the ſame year, together with ſome of his popiſh accomplices. How many years have intervened between that period and the preſent year 1788? *Anſ.* 183.

N. B. This plot is known by the name of the *Gunpowder plot*, and its diſcovery is commemorated annually on the 5th of November, the anniverſary of the day on which it was to have been put into execution.

49. Ireland

52. Ireland, as well as France and England (*o*), has fatally experienced the horrid effects of popiſh cruelty. In the year 1641, the papiſts of that kingdom, availing themſelves of the actual diſſentions and expected civil war in England, attempted to extirpate their proteſtant countrymen. In conſequence of this diabolical reſolution, 200,000 were afterwards butchered in ways too ſhocking for recital: cutting of throats, and ſtabbing, were the mildeſt death the proteſtants experienced from their inhuman murderers. This maſſacre was of infinite diſſervice to the affairs of Charles I. who was plauſibly charged with encouraging, or, at leaſt, approving of the horrid deed, and the cut-throats declared they had the king's commiſſion for what they did. This horrid tranſaction filled England with alarm: the villanous inſurgents having threatened, that when they had done with the handful that was left in *Ireland*, they would come into *England*, and do the ſame with the parliament and proteſtants here. Thus awakened to a ſenſe of danger, the Engliſh parliament put the country into an armed poſture of defence. From this period may be dated the commencement of thoſe warlike hoſtilities between Charles and the parliament, which at length terminated ſo tragically for that obſtinate and miſguided monarch. How long has the Iriſh maſſacre preceded the preſent year 1788? *Anſ.* 147 years.

53. King Charles I. after involving the nation in a bloody civil war, and being the deliberate deſtroyer, inſtead of the protector of the lives, liberties, and properties of his ſubjects, was beheaded January 30, 1649, on a ſcaffold erected for that purpoſe before the palace of White-Hall; how many years have elapſed ſince the decollation of that monarch to January 30, 1788? *Anſ.* 139.

N. B. Paſſion for power was Charles's predominant vice; idolatry to his regal prerogatives his governing principle; the intereſts of his crown legitimated every meaſure, and ſanctified in his eye the wideſt deviation from moral rule. Neither gratitude, clemency, humanity, equity, nor generoſity, have place in the fair part of his character. The want of integrity is manifeſt in every part of his conduct, and this was the vice for which, above all others, he paid the tribute of his life.

Mrs. Macaulay's Hiſt. of Eng.

It muſt, however, be admitted, that in the laſt act of his life, Charles ſhewed himſelf worthy of a milder fate. He met death with true greatneſs of ſoul.

(*o*) See queſtion 49 et ſeq.

The chief battles which were fought in the civil war between king Charles and the parliament, were thoſe of Edge-Hill, Newbury, Marſton-Moor, Naſeby, and Preſton. The engagement at Worceſter was fought between Charles II. and Oliver Cromwell, in 1651. The latter being victorious, the king eſcaped out of the kingdom, and continued abroad nine years, during which time Cromwell had the chief direction of the national affairs.

This period is called in our hiſtories, the common-wealth, or the interregnum. After the death of Cromwell, Charles was reſtored. He entered London May 29, 1660.

54. In the immoral and licentious reign of Charles II. an act was paſſed enjoining an uniformity in matters of religion, and, among other injunctions, requiring all miniſters, who would continue in the church, or be admitted to livings, to declare their aſſent and conſent to a new edition of the Common-Prayer-Book, before many of them could have an opportunity of ſeeing it. This was called the ACT OF UNIFORMITY, and cauſed upwards of 2000 conſcientious and godly miniſters to quit the church of England, and take their lot among the diſſenters, who hereby received ſo large an addition, that they may be conſidered as the fathers of the diſſenting intereſt. The glorious ſtand which theſe good men made in favour of Chriſtian liberty, did great honour to the proteſtant faith, and tended, more than a thouſand other arguments, to convince a profligate age of the REALITY OF RELIGION, and the regard that is due to the rights of conſcience.

The great Mr. Locke, ſpeaking of this arbitrary and impolitic act, obſerves that, "Bartholomew's day was fatal to our church and religion, "in throwing out a very great number of *worthy*, *learned*, *pious*, and "*orthodox* divines." This event took place Auguſt 24, 1662; how many years intervened between that period and Auguſt 24, 1788? *Anſ.* 126.

N. B. A conciſe view of the lives, characters, &c. of the ejected miniſters, may be ſeen in a work entitled the Nonconformiſt's Memorial. Nonconformity originated in a diſlike of the *diſcipline* of the eſtabliſhed church, which the ſeparatiſts thought was governed by orders unknown to the goſpel, and by ſervices inconſiſtent with its purity and ſimplicity. Not a few, however, of the modern diſſenters ſtrengthen their defence of ſeparation, by urging an additional circumſtance of much greater weight and conſequence, as a reaſon for their diſſent, namely, a diſbelief of the *doctrines* of the Engliſh church. The grand principles on which the proteſtant diſſenters ground their ſeparation from the national church, are,

are, the right of private judgment, and liberty of conſcience, in oppoſition to all human authority in matters of religion; the acknowledgment of Chriſt alone, as the appointed head of his church; and the ſufficiency of the Holy Scriptures, as the rule of faith and practice. Theſe are alſo the only principles upon which PROTESTANT Chriſtianity can be defended; and conſequently, whenever they ſhall be given up or forgotten, this nation may again be loſt in the labyrinths of popiſh ſuperſtition, and groan under the weight of church tyranny.

55. The popiſh bigot and TYRANT James II. guided by the jeſuit Peters, his confeſſor, and the infamous chancellor Jefferies, after endeavouring to ſubvert the conſtitution of the kingdom, by breaking the original contract betwixt the king and people, and violating the fundamental laws of the realm, more eſpecially thoſe enacted for the ſecurity of the proteſtant religion, being unable longer to face the juſt reſentment of his much injured ſubjects, reſigned the government in 1688, and fled to France, where he died in 1701; how long did he ſurvive his abdication? *Anſ.* 13 years.

N. B. Aſſiſted by Lewis XIV. of France, and encouraged by papiſts and tories in our own dominions, the baniſhed tyrant made ſome attempts to regain the crown. Ireland ſtill admitted his claims, and James made his public entry into Dublin, amidſt the acclamations of the inhabitants. This joy was, however, of ſhort duration. The ſplendid victory of the Boyne, which the brave king William gained in perſon, totally depreſſed his hopes, and he immediately embarked for France. Two years after this defeat, namely, in 1692, James aſſembled an army between Cherbourg and La Hogue, with a view of making a deſcent upon England. The ever-memorable naval victory which the Engliſh obtained near Cape La Hogue, again fruſtrated the preparations of France, blaſted the dethroned fugitive's expectations, and confirmed king William's ſafety. Feeble and ill-concerted efforts have been ſince made in behalf of the Stuart family. In the year 1715, ſoon after the acceſſion of George I. a rebellion was raiſed in Scotland in favour of James's ſon, known in our hiſtory by the title of the *Pretender*.

Projected by imbecility, and ſupported only by raſhneſs, this inſurrection was ſoon ſuppreſſed, and the priſons of London were crowded with his deluded adherents. The Pretender eſcaped to France, and ſeveral of the rebels were executed. The earl of Derwentwater and lord Kenmuir were beheaded on Tower-Hill.

The national tranquillity was again disturbed in the reign of George II. A. D. 1745, by another adventurer. This was the son of the old Pretender, and commonly called the *Young Pretender*. This aspiring claimant landed in Scotland, and the boldness of the enterprize astonished all Europe. After gaining some trifling advantages over the king's forces in that country, he made an irruption into England, and, for a short time, greatly alarmed the pusillanimous part of the nation. Retreating northwards again, he was at length totally defeated by the duke of Cumberland, in the glorious battle of Culloden, near Inverness in Scotland, A. D. 1746. Immediately after the engagement, the Pretender sought safety by flight. He continued wandering among the frightful wilds of Scotland, for near six months; and as thirty thousand pounds were offered for taking him, he was constantly pursued by the troops of the conqueror, and often hemmed round by his pursuers, but still rescued by some lucky accident from the impending danger, and at length he escaped to France. In the mean time, the scaffolds and gibbets were preparing for his adherents, many of whom were hanged in the neighbourhood of London and other parts. The earl of Kilmarnock, and the lords Balmerino and Lovat were beheaded on Tower-Hill. Thus ended the last effort of the Stuarts for re-ascending the throne. The Pretender died a few years ago in Rome, at a very advanced age. The young Pretender also died at the same place, last December, leaving no issue but a natural daughter. His obsequies were solemnized at his cardinal brother's bishopric at Frescati, where this prelate, the only remaining branch of the expelled Stuart family, officiated as principal mourner. He is styled Cardinal York.

56. The brave prince of Orange, afterwards William III. landed at Torbay in Devonshire, in 1688. He was invited over to England, to protect the country from the tyrannical oppressions of James II. This interesting event is styled in the British history, the GLORIOUS REVOLUTION, and king William is distinguished as the IMMORTAL DELIVERER of England, Scotland, and Ireland, from POPERY and ARBITRARY GOVERNMENT. How long has the arrival of that monarch preceded the present year 1788? *Ans.* 100 years.

N. B. The present year being the CENTENARY of king William III. it has been observed with grateful demonstrations of joy, thanksgivings, and festivity throughout the kingdom. A subscription has been opened by the Whig club for defraying the expence of erecting a splendid monument

ment in the plain of Runnamede (*p*), in commemoration of the revolution. The Revolution Society alſo intend making application to parliament, for a bill to eſtabliſh a perpetual commemoration of that event, by appointing a day of public thankſgiving for it. Theſe meaſures, if carried into execution, will not only ſerve to keep alive the gratitude we owe our great deliverer, but alſo tend to inſpire poſterity with a glowing veneration for that ſyſtem of liberty which has been acquired by the revolution. Among the numerous bleſſings which endear the memory of king William, it ſhould never be forgotten that to him is due the firſt act of TOLERATION known in the hiſtory of this country; and that he ſettled the illuſtrious family of Hanover on the throne of England. The diſſenters have ever ſince enjoyed the benefits of the act of toleration without interruption, though their liberties were greatly endangered in the latter end of queen Anne's reign. The jacobite and tory party having gained great ſtrength and influence at court, paſſed an iniquitous act called the *Schiſm-bill*, which ſuffered no diſſenters to educate their own children. The death of the queen, however, prevented the diſſenters from being again enſlaved. She died the *very day* the infamous act was to have taken place, namely Auguſt 1, 1714, when the elector of Brunſwick, George I. a firm friend to civil and religious liberty, was proclaimed king of Great-Britain, who procured a repeal of the *Schiſm-bill* in the 5th year of his regin. With the queen ended the line of the Stuarts, which, from the acceſſion of James I. A. D. 1603, had ſwayed the ſceptre of England 111 years, and that of Scotland 343 years, from the acceſſion of Robert II. A. D. 1371.

Whig and tory are popular terms of uncertain derivation. By the former is generally underſtood a friend to civil and religious liberty; by the latter, the reverſe. Jacobite ſignifies an adherent of the Stuart family, and has much the ſame import with tory.

57. Topaz is a gem or precious ſtone of a pure yellow colour. The fineſt bear a marked reſemblance to gold in ſplendor and colour; and though the four great diviſions of the world ſupply them, the oriental are in higheſt eſtimation. Tavernier mentions one in the great Mogul's poſſeſſion, which coſt £20,300 ſterling. What is the difference between the value of this gem, and the diamond among the Perſian emperor's regalia, which is eſtimated at £779,246 ſterling? *Anſ.* £758,946.

(*p*) See queſtion 38.

58. Suppoſe

58. Suppoſe a perſon is indebted to another the ſum of £500, and pays him at one time £25, at another £374 10*s.* 5*d.* and at another £48 5*s.* how much remains unpaid? *Anſ.* £52 4*s.* 7*d.*

59. A merchant, on commencing buſineſs, owes £764, has in caſh £10,000, and clears the firſt year £1000 15*s.* 6*d.* what was the balance at the expiration of that period? *Anſ.* £10,236 15*s.* 6*d.*

60. If a horſe and chaiſe coſt £64 10*s.* and the horſe be valued at £26 5*s.* what is the price of the chaiſe? *Anſ.* £38 5*s.*

61. Suppoſe a gentleman's ſteward to receive rents to the amount of £5000, after remitting the ſums of £420, £919 10*s.* and £210 19*s.* 6*d.* to his employer, what ſum remains in his hands? *Anſ.* £3,449 10*s.* 6*d.*

MULTIPLICATION.

62. THE French, about the reign of Francis I. were the inventors of coaches. Fitz-Allen, earl of Arundel, introduced them into England, in 1580; and, about the year 1605, they were already in general uſe among the nobility and gentry in London. Hackney-coaches firſt began to ply in the ſtreets of this city, or rather waited at inns, in 1625, and were then only 20 in number. So rapid has their increaſe been ſince that period, that London and Weſtminſter now contain a thouſand, each of which pays to government 10*s.* per week for a licence, which amounts to the ſum of £26,000 annually. Suppoſing each coach to earn 14*s.* per day on an average, which is deemed a very moderate computation, the ſum of £700 ſterling is expended daily in the metropolis, in coach hire, excluſive of what is ſpent in glaſs-coaches, or unnumbered ones. What is the weekly, monthly, and yearly expenditure in the uſe of theſe vehicles? *Anſ.* £4,900 per week,—£19,600 per month,—£254,800 per year.

N. B. Thirteen months are reckoned to the year.

63. Poſts, in their preſent improved ſtate, are of very modern invention; for, even in France, the firſt place of their adoption, they were, in 1619, ſtill unprovided with a letter-office. The year 1635, during Charles I's reign, preſents the firſt regular eſtabliſhment of the kind in England,

England. A private perſon projected, in 1683, the uſeful conveyance of letters and parcels, by the penny-poſt, through London and its ſuburbs. Pigeons are the vehicles of a great part of the poſtage in the Mogul empire. The ſame winged meſſengers have been uſed by the Dutch in ſieges: and Tavernier obſerves, that, at this day, the conſul of Alexandretta tranſmits daily intelligence by them to Aleppo. In 1764 the groſs amount of our inland and foreign offices was after the rate of £36,004 per calendar month; what was the annual income at that period. *Anſ.* £432,048.

64. The earth on which we live is of a circular form, and one of the planets belonging to the ſolar ſyſtem. It has two motions; one round its own axis, which is performed in 24 hours: the other round the ſun, which it accompliſhes in a year. The former cauſes the regular ſucceſſion of day and night; and the latter occaſions the grateful viciſſitude of the ſeaſons, and the difference of the length of the days and nights. Aſtronomers aſſert, that, in the laſt mentioned courſe it moves with the velocity of 68,000 miles an hour. How many miles, according to this calculation, does it travel in its annual revolution, admitting the year to contain 8,766 hours? *Anſ.* 596,088,000 miles.

N. B. By the ſolar ſyſtem is meant the order and diſpoſition of the ſeveral heavenly bodies, which revolve round the ſun, as the centre of their motion, and receive their light and heat from it. Theſe celeſtial ſpheres conſiſt of planets and comets. Under the denomination of planets are comprized Mercury, Venus, the Earth, Mars, Jupiter, Saturn, and the Georgium Sidus; their ſeveral diſtances from the ſun are mentioned in the firſt page of this work.

Comets are defined to be ſolid compact bodies, like other planets, and regulated by the ſame laws of gravity. They move about the ſun in very eccentric orbits, and are of a much greater denſity than our earth; for ſome of them are heated in every period to ſuch a degree as would vitrify or diſſipate any ſubſtance known to us (*q*). Comets are always attended with long tranſparent trains, or tails, iſſuing from that ſide of them which is turned away from the ſun: that which appeared in 1680 drew after it a tail of fire that was fourſcore millions of miles in length (*r*). There are ſuppoſed to be 21 comets belonging to the ſolar ſyſtem; but the periods of three of them only are known with any certainty. Theſe

(*q*) Page 1. (*r*) Guardian, No. 103, Vol. II.

return

return at intervals of 75, 129, and 575 years. One of them is expected to return in the enſuing year. The comet which appeared in 1680, approaches in one part of its orbit, very near to the orbit of our earth; ſo that, according to ſome eminent philoſophers, it may, in ſome future revolutions, approach near enough to have very conſiderable, if not fatal effects upon it.

65. The government of the kingdom of Great-Britain is a limited hereditary monarchy, both males and females being capable of ſucceſſion. The king, however, notwithſtanding the limitations to which the crown is ſubject, is one of the greateſt monarchs reigning over a FREE PEOPLE, from whom *ſolely* deriving his power, he is accountable to them for the delegated truſt. It is the great conſtitutional doctrine of this happy country, that kings can only be ſecure in their royalty, while they make the felicity of their ſubjects, by a juſt adminiſtration of the laws, the rule and end of their government. By a fundamental law of the realm, the Britiſh ſovereign muſt profeſs the PROTESTANT religion, neither can he marry a PAPIST. His ſtated income, commonly called the civil liſt, is after the rate of £75,000 per calendar month: how much is that per annum? *Anſ.* £900,000.

66. The manſion-houſe was built by the city for the reception of their chief magiſtrate, during his mayoralty. It was finiſhed in the year 1753, at the expence of £40,000 ſterling. To ſupport the dignity of his important office, the lord-mayor is allowed by the city an annual ſum equal to £500 per calendar month. How much is his yearly income. *Anſ.* £6000.

N. B. Richard I. in the year 1189, firſt changed the bailiffs, or chief magiſtrates of London, into mayors, by whoſe example others were afterwards appointed. The mayor is annually choſen by his peers out of the body of aldermen, whoſe number in London is 26, and who preſide over the 26 wards of the city. The flattering title of *lord* is ſaid to have been firſt annexed to that of mayor, in the time of Richard II. This happened in conſequence of William Walworth, then mayor of London, having, with a blow of his mace, ſtunned the famous rebel Wat Tyler, (whom Philpot immediately diſpatched) during a conference which this demagogue had with that monarch in Smithfield. A. D. 1381.

67. A perſon leaving 25 poor relations £150 each, what was the ſum bequeathed? *Anſ.* £3,750.

68. What

68. What prize in a lottery will admit each perſon in a club, conſiſting of 16 members, to receive the ſum of £625? *Anſ.* £10,000.

69. A privateer of 144 men took a prize, which amounted to £25 15*s.* 6*d.* each man; what was the value of the prize, ſuppoſing the officers to have previouſly received £1000? *Anſ.* £4,711 12*s.*

70. What ſum of money muſt be divided among 18 men, ſo that each may receive £14 6*s.* 8*d.* ½? *Anſ.* £258 0*s.* 9*d.*

71. Twenty perſons received each £250, what was the ſum diſtributed? *Anſ.* £5000.

72. If a footman's wages be £3 12*s.* 6*d.* per quarter, how much is that per annum? *Anſ.* £14 10*s.*

73. If ſix perſons receive £31 3*s.* 1*d.* each, what was the ſum divided among them? *Anſ.* £186 18*s.* 6*d.*

74. Suppoſing cambric to be purchaſed at 5*s.* 4*d.* per yard, what would be the value of 9 yards? *Anſ.* £2 8*s.*

75. At 6*s.* 8*d.* per pound, what is the value of 10 lbs. of tea? *Anſ.* £3 6*s.* 8*d.*

76. Purchaſed 11 yards of riband, at 8*d.* ½. per yard, what was paid for them? *Anſ.* 7*s.* 9*d.* ½.

77. Admitting a perſon to ſave £41 13*s.* 4*d.* annually, for the ſpace of 12 years, how much would be ſaved at the expiration of that time? *Anſ.* £500.

78. At 6*d.* ½ per pound, how much would 16 lbs. of cheeſe amount to? *Anſ.* 8*s.* 8*d.*

79. Houſe expences being £25 per month, or £75 per quarter, to how much do they amount annually? *Anſ.* £300.

BILLS OF PARCELS.

A MERCER's BILL.

Mrs. JONES,

Bought of WILLIAM BROOK, March 4, 1788.

			s.	d.		£	s.	d.
9	Yards of ſilk — —	at	13	6	— per yard	—	—	
14½	Yards of flowered do.	at	15	11	— per yard	—	—	
23	Yards of ſarſenet —	at	6	4	— per yard	—	—	
30½	Yards of brocade —	at	9	11½	— per yard	—	—	
15¼	Yards of Genoa velvet	at	19	10	— per yard	—	—	
18	Yards of luſtring —	at	5	8	— per yard	—	—	
						£60	6	1¼

A LINEN-DRAPER's BILL.

Mr. SALMON,

Bought of JOHN WILLIAMS, Jan. 4, 1788.

			s.	d.		£	s.	d.
34	Ells of dowlas —	at	1	10	— per ell	—	—	—
28¼	Ells of holland —	at	5	6	— per ell	—	—	—
13½	Ells of diaper —	at	1	4½	— per ell	—	—	—
58	Damaſk napkins —	at	2	3	— each	—	—	—
5½	Yards of cambric	at	13	7	— per yard	—	—	
74¾	Yards of muſlin —	at	8	11	— per yard	—	—	
						£55	8	0

A MILLINER's BILL.

Mrs. PHILLIPS,

Bought of KATE WATSON, June 4, 1788.

			s.	d.		£	s.	d.
18½	Yards of fine lace —	at	15	7	— per yard	—	—	
12	Pair of kid gloves —	at	2	2	— per pair	—	—	
18	French mounted fans	at	3	9	— each	—	—	—
4	Fine lace tippets —	at	7	10	— each	—	—	—
4	Doz. linen gloves —	at	1	4	— per pair	—	—	
8	Sets of knots — —	at	2	6	— per ſet	—	—	
						£24	17	1½

DIVISION.

80. PIOUS perſons have, in all ages, been eminent in veneration for the Holy Scriptures. Joſephus atteſts the zeal with which his countrymen initiated their children at the tendereſt age in this divine ſtudy; a teſtimony ſtrongly confirmed by St. Paul, where he commends Timothy (*s*), who had been educated a Jew, for having improved the acquaintance his infancy had contracted with the inſpired writers. Tertullian is ſaid to have devoted his days and nights to meditation on them. Theodoſius the younger, emperor of the eaſt, was able to repeat entire books of ſacred writ verbatim. Origen's repoſe was always preceded, as his repaſt had been accompanied, by the ſame ſacred lecture. Euſebius declares his having been preſent when a confeſſor, whoſe eyes had been burnt out in Diocleſian's perſecution, recited ſeveral parts of the Bible with the accuracy of a reader. Ancient church hiſtory records various inſtances of ſimilar diligence; and, in more modern times, we read that Zuingle tranſcribed all St. Paul's epiſtles, and committed them to memory. Beza tenaciouſly retained at 80 the familiarity his youth had contracted with them in Greek. Biddle got the greateſt part, and Cranmer and Ridley, thoſe renowned martyrs (*t*), learnt the *whole* of the New Teſtament by heart; the former in his journey to Rome, the latter in the walks of Pembroke-Hall, Cambridge. To decline adverting to perſons of inferior endowments of nature, and attainments of ſtudy, few are ſtrangers to the profound reverence which Locke, Newton, Milton, Addiſon, Bacon, and Boyle, entertained for the canonic books. The much admired author of "Thoughts on the Manners of the Great," characterizes thoſe illuſtrious ornaments of our nation, as the deepeſt metaphyſician, the greateſt aſtronomer, the ſublimeſt poet, the politeſt writer, the moſt conſummate philoſopher, and the profoundeſt inveſtigator of nature, which this, or perhaps any country has produced. And as they were perſons generally eſteemed for their virtue and goodneſs, their examples ſhew us, that a ſtrong and clear reaſon, when it is not under the influence of vice or pride, naturally leads to the belief of REVELATION. Knox, in his Treatiſe on Education, attributes part of the prevalence of irreligion in

(*s*) 2 Tim. iii. 15. See alſo Acts xvii. 11——xviii. 24.

(*t*) They ſuffered in Mary's reign, ſee page 16.

the preſent day, to the growing neglect of the long eſtabliſhed method of teaching children to read by uſing the Teſtament. No book, continues that elegant writer, is ſo well adapted to this purpoſe. The language is remarkably eaſy and familiar, and the matter entertaining to young minds. The early uſe of it may impreſs on the memory many ſcriptural paſſages, which would never be properly attended to at another age. This laſt remark merits the ſerious conſideration of thoſe who are concerned in the important charge of directing the ſtudies of youth. The Old Teſtament contains 929 chapters, and the New 260; how many chapters are to be daily read, that a year may complete the peruſal of the whole? and how many chapters per week will finiſh the latter book in the ſame ſpace of time? *Anſ.* $3\frac{1}{4}$ daily, 5 chapters weekly.

The following was printed in the *Moral Magazine*, for Auguſt 1778: it is inſerted here as a matter of mere curioſity, for the amuſement of my young readers.

The OLD and NEW TESTAMENT diſſected.

Books in the Old	—	39	In the New		27	Total	—	66
Chapters	— —	929	— —	—	260	— —	—	1189
Verſes	— —	23,214	—	—	7,959	—	—	31,173
Words	— —	592,439	—	—	181,253	—	—	773,692
Letters	— —	2,728,100	—	—	838,380	—	—	3,566,480

APOCRYPHA.

Chapters — 183 | Verſes — 6,081 | Words — 152,185

The middle chapter and the leaſt in the Bible is Pſalm 117.
The middle verſe is the 8th of the 118th Pſalm.
The word AND occurs in the Old Teſtament 35,543 times.
The ſame in the New Teſtament occurs 10,684 times.
The word GOD occurs 6,855 times.

OLD TESTAMENT.

The middle book is Proverbs.
The middle chapter is Job 29.
The middle verſe is 2d Chronicles, 20th chapter between the 17th and 18th verſes.
The leaſt verſe is the 1ſt Chronicles, 1ſt chapter and 1ſt verſe.

NEW

NEW TESTAMENT.

The middle book is Theſſalonians the 2d.
The middle chapter is between the 13th and 14th of Romans.
The middle verſe is 17th chapter of Acts and 17th verſe.
The leaſt verſe is 11th chapter of John 35th verſe.
The 21ſt verſe of the 7th chapter of Ezra hath all the letters of the alphabet.
The 19th chapter of 2d Kings and 37th of Iſaiah are alike.

N. B. The above took three years in caſting.

81. Light is ſaid to move with ſuch amazing rapidity as to paſs from the ſun to our earth in the ſpace of 8 minutes: how much is that per minute, ſuppoſing the diſtance, according to the uſual computation, to be 95,000,000 Engliſh miles? *Anſ.* 11,875,000 miles.

82. Sound, according to experiments made by Dr. Derham and other philoſophers, flies at the rate of 1142 feet, in a ſecond of time. A ſtory is told of a centinel at Windſor having exculpated himſelf from the charge of ſleeping on duty, by declaring that St. Paul's clock had juſt ſtruck 13 inſtead of 12, which, on inquiry, is ſaid to have been corroborated by the teſtimony of reſpectable perſons in London. Suppoſing Windſor-Caſtle to be 24 miles or 126,720 feet from St. Paul's, how long was the ſound going to the centinel? *Anſ.* 110 ſeconds $\frac{1100}{1142}$ or about 1 minute $\frac{3}{4}$.

N. B. There are many inſtances on record of the great diſtance at which ſounds have been heard. The report of the guns, in the naval engagement between the Engliſh and Dutch, in 1672, is affirmed to have been heard at the diſtance of 200 miles.

83. The circumference of our earth under the equator is 21,600 geographical, or 25,020 Engliſh miles; now this body turning on its axis in about 24 hours, at what rate an hour, Engliſh meaſure, are the inhabitants, ſituated under the equator, carried from weſt to eaſt by the rotation? *Anſ.* 1042$\frac{1}{2}$ miles.

N. B. The perſons thus ſituated are thoſe living in the iſlands of Celebes, Borneo, and Sumatra, in the Eaſt-Indies; in the ſouth part of Africa; and in Terra Firma and Guiana, in South America.

84. The velocity of the parts of the earth near the equator greatly exceeds the rapidity of motion of the parts in latitudes approaching the poles,

poles, as will be evident by the bare inſpection of a terreſtrial globe. In the parallel of latitude in which London is ſituated, a degree of longitude is only about 37 geographical, or 42 Engliſh miles; conſequently the circumference of the globe in this parallel is but about 15,120 Engliſh miles. At what rate per hour are *we* carried by the earth's diurnal rotation? *Anſ.* 630 miles.

85. Xerxes, ſon of Darius 1ſt, was a potent monarch of Perſia, in Aſia. About 481 years B. C. he invaded Greece with a prodigious army, conſiſting, according to ſome accounts, of 3,000,000 of perſons, including attendants, &c. To croſs the Helleſpont, a ſtrait between Europe and Aſia, he conſtructed a floating bridge of boats, over which this vaſt number paſſed in 7 days and nights. Suppoſing them to have gone in regular ſucceſſion, how many went over, on an average, in an hour? *Anſ.* 17,157 $\frac{24}{168}$.

N. B. The fleet which accompanied this immenſe land force is ſaid to have conſiſted of 2000 ſail. The only ſucceſsful operation of this unwieldy armament was the capture and conflagration of the city of Athens, which its inhabitants had previouſly deſerted. Diſgrace and diſaſter attended every other movement of its ſhort exiſtence. The army was ignominiouſly repulſed at the ſtraits of Thermopylæ by the ILLUSTRIOUS HERO, LEONIDAS, king of Sparta, with only 4000 choſen Lacedemonians; and Themiſtocles, with no more than 380 ſail, diſperſed, and, in a great meaſure, deſtroyed the fleet near the iſland of Salamin. Xerxes ſhortly after eſcaped from Greece, leaving the remains of his deſerted army to encounter future calamities in the beſt manner it could. On his arrival at the place where the bridge of boats had been conſtructed, he found it demoliſhed by a tempeſt, and his thraſonic majeſty was conſtrained to commit his auguſt perſon to the conveyance of a cock-boat. This ſudden and ſignal reverſe of fortune, while it conveys a forcible image of the mutability of ſublunary things, and the inſtability of human greatneſs, affords a memorable example of the heroic ardor with which LIBERTY has been defended by its votaries; as well as the diſappointment and diſhonour which await the moſt formidable preparations to extend dominion over FREE MEN, whoſe necks, venality, diſſipation, and luxury, have not previouſly *poliſhed* for the reception of the yoke of ſlavery (*u*).

(*u*) See the battle of Marathon, queſtion 12.

86. Latitude

86. Latitude and Longtitude are geographical terms: the former is the diſtance of a place north or ſouth from the equator, meaſured in degrees, &c. on the meridian. The latter is the diſtance of a place from ſome firſt meridian, eaſt or weſt, meaſured on the equator. The greateſt latitude any place can have is 90, and the greateſt longitude 180 degrees. Longitude may be alſo reckoned by time: for the circumference of the earth being 360 degrees, and its diurnal revolution performed in 24 hours, it follows, that 1 hour of time is equal to 15 degrees of longitude; and ſo in proportion for any greater or leſs quantity: conſequently a place which has the ſun 1, 2, or 3 hours before or after another place, muſt be ſituated 15, 30, or 45 degrees eaſt or weſt of the meridian of ſuch a place. Hence, dividing the longitude of any place by 15, will give the number of hours which that place has the ſun before or after perſons who live under the firſt meridian. Peterſburgh and Conſtantinople are ſituated about 30 degrees eaſt of the meridian of London: what is the hour at thoſe places when it is noon with us? *Anſ.* 2 o'clock in the afternoon.

87. Botany-Bay, in New-Holland, is ſituated 150 degrees eaſt of the meridan of London: what is the hour at that place when it is noon with us? *Anſ.* 10 o'clock at night.

88. Jamaica, a Weſt-India iſland, is about 75 degrees weſt of the meridian of London; how much after us have perſons ſo ſituated their hour? *Anſ.* 5 hours; conſequently when it is noon with us, it is only 7 o'clock in the morning with them; or when it is 5 in the afternoon with us, it is only noon with them.

89. Powell, the celebrated walker, went a few years ago on foot from London to York, and back again, in ſomewhat leſs than 6 days. In the courſe of the journey, he reſted 40 hours. Suppoſing the diſtance between London and York to be 201 miles, how far did he go on an average per hour? *Anſ.* $3\frac{3}{4}$ miles.

N. B. This noted pedeſtrian performed the ſame journey this preſent year 1788, in 140 hours.

90. Euchidas, a citizen of Platæa, went from thence to Delphos, to bring the ſacred fire. This he obtained, and returned with it the ſame day before ſun-ſet, having travelled 125 Engliſh miles. No ſooner had he ſaluted his fellow-citizens, and delivered the fire, than he fell at their feet,

feet, and inſtantly expired (*x*). Allowing him 18 hours for the performance of his journey, at what rate did he go per hour? *Anſ.* 6¾ miles.

91. The earth goes 596,088,000 Engliſh miles in its annual revolution round the ſun; how many miles is that per hour, admitting the year to contain 8766 hours? *Anſ.* 68,000.

92. Divide a lottery ticket of £10,000 value, among 16 perſons: what is the value of each ſhare? *Anſ.* £625.

93. Deduct £1000 from £4,711 12*s.* and divide the remainder among 144 men; to how much does the ſhare of each amount? *Anſ.* £25 15*s.* 6*d.*

94. Divide £258 0*s.* 9*d.* among 18 perſons. *Anſ.* £14 6*s.* 8*d.* ½. each.

95. Divide £5000 among 20 perſons. *Anſ.* £250 each.

96. A perſon bequeathed £3,750 among 25 poor relations; what did each receive? *Anſ.* £150.

97. If a footman's wages be £14 10*s.* per annum, how much is that per quarter? *Anſ.* £3 12*s.* 6*d.*

98. Divide £186 18*s.* 6*d.* into 6 ſhares? *Anſ.* £31 3*s.* 1*d.*

99. If 9 yards of cambric coſt £2 8*s.* how much is that per yard? *Anſ.* 5*s.* 4*d.*

100. Purchaſed 10 lbs. of tea for £3 6*s.* 8*d.* at what rate was it bought per lb. *Anſ.* 6*s* 8*d.*

101. If 11 yards of riband coſt 7*s.* 9*d.* ½. what is that per yard? *Anſ.* 8*d.* ½.

102. A tradeſman gained £500 in 12 years; how much was that per annum, ſuppoſing he ſaved an equal ſum yearly? *Anſ.* £41 13*s.* 4*d.*

(*x*) Rollin's Ancient Hiſtory, Vol. II. p. 509.

103. Gave 8*s*. 8*d*. for 16 lbs. of cheeſe; at what rate was it purchaſed per lb. *Anſ*. 6*d*. ½.

104. Houſe-expences being £300 per annum, how much is that per week, month, or quarter? *Anſ*. £5 15*s*. 4*d*. ½. per week, £25 per month, £75 per quarter.

105. That eminent friend of humanity Mr. John Kyrle, celebrated by Pope in his epiſtle to Lord Bathurſt, under the title of the "Man of Roſs," poſſeſſed an eſtate of £500 a year, out of which he reſerved only £50 for his own uſe, devoting the reſt to charitable purpoſes; how much did he beſtow weekly on an average? *Anſ*. £8 13*s*. o*d*. ¾.

106. The lord-mayor's annual income is £6000, how much is that per month, per week, and per day? *Anſ*. £500 per month, £115 7*s*. 8*d*. ¼. per week, £16 8*s*. 9*d*. per day.

107. The king's annual income is £900,000, how much is that per month, per week, and per day? *Anſ*. £75,000 per month, £17,307 13*s*. 10*d*. per week, £2,465 15*s*. o*d*. ¼. per day.

108. The galleon of Manilla is a ſhip employed in the trade from Manilla in the iſland of Luconia, the chief of the Philippines, to Acapulco, on the coaſt of Mexico. The cargo of this veſſel is very valuable. The galleon taken by commodore, afterwards lord Anſon, in the Pacific Ocean, in 1740, was eſtimated at £313,000 ſterling. Suppoſing the half of this ſum to belong to the officers, and the remainder to be equally divided among 600 ſeamen, what is the amount of each man's ſhare? *Anſ*. £260 16*s*. 8*d*.

109. Diamond is a precious ſtone, the firſt of all gems in rank, value, hardneſs, and luſtre. The goodneſs of diamonds conſiſts in their water (i. e. colour) luſtre, and weight. They are found in the Eaſt-Indies, principally in Golconda. The moſt valuable now known are, 1ſt, that in France, which is one of the crown jewels; 2d, governor Pitt's diamond, purchaſed by the duke of Orleans for Lewis XV. king of France, for £125,000 ſterling; and, 3d, that of the great Mogul, computed to be worth £779,246. If the laſt mentioned ſum were divided among 500 perſons, how much would each ſhare amount to? *Anſ*. £1,558 9*s*. 10*d*.

110. The firſt lottery in England of which we have any account, was drawn at the weſt door of St. Paul's cathedral, in 1569, and conſiſted of 40,000 lots at 40*s.* each. The prizes were plate, and the profits were to be applied towards repairing the havens of this kingdom. In 1612, king James, for the plantation of Engliſh colonies in Virginia, appointed a lottery at the place where the one juſt mentioned had been determined. The principal prize of this laſt was 4000 crowns in fair plate. In the ſtate lottery of the year 1787, one of the £20,000 prizes came to a club conſiſting of 35 clerks in the India-houſe. To how much did the ſhare of each amount? *Anſ.* £571 8*s.* 6*d.* ¾.

REDUCTION

IS the method of bringing numbers from one name or denomination to another, ſo as ſtill to retain the ſame value; and is performed by Multiplication and Diviſion: by the former great names are brought into leſs, and by the latter leſs are brought into greater.

EXAMPLES.

111. In £12, how many farthings? *Anſ.* 11,520.

112. In £1,827, how many pence? *Anſ.* 438,480.

113. In 4,154*s.* how many farthings? *Anſ.* 199,392.

114. In 35 guineas, how many farthings? *Anſ.* 35,280.

115. In £7 and a crown, how many pence? *Anſ.* 1,740.

116. In £7 5*s.* 3*d.* ¾. how many farthings? *Anſ.* 6,973.

117. In 15 crowns, how many ſhillings and ſixpences? *Anſ.* 75 ſhillings. 150 ſixpences.

118. In £25 14*s.* 1*d.* how many ſhillings and pence? *Anſ.* 514*s.* 6,169*d.*

119. In

119. In 6,897 crowns, how many groats? *Anſ.* 103,455.

120. In 1,020 moidores, how many farthings? *Anſ.* 1,321,920.

121. In £231 16*s.* how many ducats, at 4*s.* 9*d.* each? *Anſ.* 976.

122. In 11,520 farthings, how many pence, ſhillings, and pounds? *Anſ.* 2,880*d.* 240*s.* £12.

123. In 17,280 farthings, how many pence, ſhillings, and pounds? *Anſ.* 4,320*d.* 360*s.* £18.

124. In 21,168 farthings, how many guineas? *Anſ.* 21.

125. In 130 ſhillings, how many crowns and pence? *Anſ.* 26 crowns, 1,560*d.*

126. In £63, how many crowns, ſhillings, and guineas? *Anſ.* 252 crowns, 1,260 ſhillings, 60 guineas.

127. Black-friars-bridge was begun in 1760, and finiſhed in 1770, at the expence of £152,840 ſterling; how many guineas did it coſt? *Anſ.* 145,561 guineas and 19*s.*

128. Weſtminſter-bridge is reckoned one of the moſt complete and elegant ſtructures of the kind in the world. It was begun in 1738, and finiſhed in 1750, at the expence £389,000 defrayed by the parliament; how many pence did it coſt? *Anſ.* 93,360,000*d.*

129. The monument near London-bridge, was erected to perpetuate the memory of the dreadful fire which broke out in 1666, in the reign of Charles II. and deſtroyed almoſt the whole city. This magnificent column was built by Sir Chriſtopher Wren. It is 15 feet in diameter, and 202 in height, and coſt the city £13,000; how many crowns and half crowns are in that ſum? *Anſ.* 52,000 crowns, 104,000 half crowns.

130. St. Paul's cathedral is the moſt capacious, magnificent, and regular proteſtant church in the world. It is built of Portland ſtone, after the manner of St. Peter's at Rome, and is the principal work of Sir Chriſtopher Wren, who laid the firſt ſtone in 1673, and ſaw it completed

in 1710. The length of this famous church within is 500 feet, and its height 340. The expence of building it is computed by ſome at £800,000; by others at £1,000,000 ſterling; which was defrayed by a duty on coals. How many ſixpences are in the laſt mentioned ſum? *Anſ.* 40,000,000.

131. The Royal-Exchange, built in 1567 by Sir Thomas Greſham, was deſtroyed near a century after by the great fire. The preſent ſtructure of the ſame name, erected in 1670, coſt about £80,000. How many crowns and pence are in that ſum? *Anſ.* 320,000 crowns, 19,200,000 pence.

132. The national debt in the beginning of the year 1786 amounted to £239,154,879; how many farthings are in that ſum?
Anſ. 229,588,683,840.

133. The intereſt of the national debt in the year 1787, amounted to £9,275,769; how many twopences are in that ſum? *Anſ.* 1,113,092,280.

134. According to an eſtimate delivered to the houſe of commons, in May 1788, by Mr. Pitt, the laſt year's national revenue, including the land and malt, was a ſum equal to 15,160,320,000 farthings; how many pounds ſterling do they contain? *Anſ.* £15,792,000

135. King Charles II. in the year 1662, to ſupply his extravagance, had the baſeneſs to ſell Dunkirk, a noted ſea port in Flanders, to the French for 5,000,000 livres. On the ſuppoſition that a livre is worth 10*d.* ſterling, what is the amount of the above ſum in our currency? *Anſ.* £208,333 6*s.* 8*d.*

136. Charles II. married Catharine the infanta of Portugal; a meaſure of which his neceſſities were the ſole motive. The princeſs had for her portion the fortreſs of Tangier in Africa, the iſland of Bombay in the Eaſt-Indies, and £300,000 ſterling. How many groats are in that ſum? *Anſ.* 18,000,000.

TROY WEIGHT.

137. IN 27 ounces of gold, how many grains? *Anſ.* 12,960.

138. In 12,960 grains, how many ounces? *Anſ.* 27.

139. In 3 lb. 10 oz. 7 dwts. 5 grs. how many grains? *Anſ.* 22,253.

140. In 1,987,200 grains, how many pounds? *Anſ.* 345.

141. In 31 lb. 10 oz. 18 dws. 20 grs. of ſilver, how many ingots, each weighing 7 lb. 11 oz. 14 dwts. 17 grs.? *Anſ.* 4.

142. In 50 oz. 8 dwts. of ſilver, how many ſpoons of 2 oz. 16 dwts. each? *Anſ.* 18.

143. The neceſſities of Henry V. were ſo great in the year 1417, that, to enable him to carry on the war with France, he pawned ſeveral valuable articles; among which were two gold chaſed baſons. Theſe he pledged to a minor canon of St. Paul's for 600 marks. The baſons weighed 28 lb. 8 oz. how many grains did they contain? *Anſ.* 165,120 grains.

N. B. Henry V. king of England, 1413, eldeſt ſon of Henry IV. was an illuſtrious hero (*y*), but by no means juſtifiable in his claim to the crown of France; nor does it appear from hiſtory that his Engliſh ſubjects derived any benefit from his conqueſt of France, of which he was made regent, and heir to that kingdom, after the death of Charles VI. the reigning monarch, whoſe daughter he married. Henry fixed his reſidence at Paris, and, on Whitſunday, in the year 1421, the two kings and their two queens with crowns on their heads, dined together in public; Charles receiving apparent homage, but Henry commanding with abſolute authority. Henry died in France in 1422; and the Engliſh by degrees loſt all their poſſeſſions in that kingdom; a circumſtance which able politicians

(*y*) See battle of Agincourt, queſtion 43.

have

have conſidered rather as a bleſſing than a misfortune to this country. Had an Engliſh king entirely ſubdued France, his conſtant reſidence would probably have been in that kingdom, and England might have become a mere province of that nation.

144. Gold is the moſt valuable of metals, and all known parts of the earth yield it, though with great difference in point of purity and plenty. South-America furniſhes the moſt: but this precious metal is found in conſiderable abundance in the Eaſt-Indies, in Hungary, and in Africa. It is uſually found in mines; but is ſometimes met with in the ſand and mud of rivers and torrents, particularly in Guinea. This is called gold duſt. We receive about 3,000 ounces of it yearly. How many pennyweights and grains do they contain? *Anſ.* 60,000 dwts. 1,440,000 grs.

N. B. Our gold coin called a guinea received that denomination, becauſe the gold of which the firſt was ſtruck had been brought from that part of Africa. It formerly bore the impreſſion of an elephant on the ſame account.

145. Silver is the moſt precious of all metals, except gold. The uſe of it is of great antiquity, as may be inferred from Gen. xlvi. 2. "Put my *ſilver* cup in the ſack's mouth." The mines of Peru, in South America, are the richeſt in the world. The largeſt piece of ſilver ore of which we have any account, was, however, dug in the mines of Norway. It is preſerved in the king of Denmark's muſeum of curioſities at Copenhagen, is valued at 5000 crowns, and weighs 560 lbs. How many grains are in that quantity? *Anſ.* 3,225,600.

146. The gigantic Philiſtine Goliah ſlain by David (z), was, according to ſome calculators, 11, according to others upwards of 12 Engliſh feet in height. His coat of mail weighed 5,000 ſhekels of braſs, and the head of his ſpear 600 ſhekels of iron. Suppoſing a ſhekel to be 10 dwts. how much did each weigh? *Anſ.* 208 lbs. 4 oz. coat of mail.
25 — 0 head of the ſpear.

147. Jewiſh doctors greatly differ in eſtimating the weight of the ſhekels ſo often mentioned in the Old Teſtament. One in the French king's cabinet is ſaid to weigh 268 grains. Biſhop Cumberland always found

(z) 1 Sam. ch. xvii.

each

each of the many he had weighed about half an ounce, or 240 grains. According to this latter calculation, what was the weight of the handſome Abſalom's hair, which it is ſaid (*a*), weighed 200 Shekels? *Anſ.* 8 lbs. 4 oz. Troy.

AVOIRDUPOIS WEIGHT.

148. IN 14,769 ounces, how many cwt.? *Anſ.* 8 cwt. 0 qrs. 27 lb. 1 oz.

149. In 8 cwt. 0 qr. 27 lb. 1 oz. how many ounces? *Anſ.* 14,769.

150. In 27 cwt. of raiſins, how many parcels of 18 lbs. each? *Anſ.* 168.

151. In 83 lb. 12 oz. 4 drs. how many drams? *Anſ.* 21,444.

152. In 21,444 drams, how many pounds? *Anſ.* 83 lb. 12 oz. 4 drs.

153. In 34 tons, 17 cwt. 1 qr. 19 lb. how many pounds? *Anſ.* 78,111.

154. The battering ram employed by Titus to demoliſh the walls of Jeruſalem (*b*), is ſaid to have weighed 100,000 lbs. how many tons do they contain? *Anſ.* 44 tons, 12 cwt. 3 qrs. 12 lbs.

N. B. Gunpowder and guns, are ſaid not to have been invented till about the year 1330. It is aſſerted by Voltaire, that the Venetians firſt uſed fire-arms in an engagement at ſea againſt the Genoeſe, in 1376; but Rapin and other hiſtorians affirm, that the Engliſh had guns at the battle of Creſſy, in 1346; and the year following at the ſiege of Calais.

155. The Spectator's club, mentioned in the ninth number, is ſaid to have conſiſted of 15 perſons, who weighed together 3 tons; how much is that per man? *Anſ.* 4 cwt.

156. Mr. Thomas Bright, of Malden in Eſſex, who died in the year 1750, is ſuppoſed to have been one of the largeſt men that ever lived.

(*a*) 2 Sam. xiv. 25, 26. (*b*) See queſtion 32.

Seven

Seven perſons of ordinary ſize were with eaſe encloſed in his waiſtcoat. He weighed 42½ ſtone, horſeman's weight, *i. e.* 14 lb. to the ſtone; how many hundred weight do they contain? *Anſ.* 5 cwt. 1 qr. 7 lb.

157. The coloſſus at Rhodes was a ſtatue of braſs erected to the ſun, at the mouth of that city's harbour. It was 105 feet high, and proportioned in all its parts. Chares, of Lindus, devoted 12 years to the completion of the work, which occurred 288 years B. C. 66 years ſubſequent to its erection, an earthquake overthrew it, and it lay neglected 894 years, that is, till the year of our Lord 672; when Moarvias the 6th caliph, or emperor of the Saracens having taken Rhodes, ſold the braſs of this wonder of the world (*c*) to a Jewiſh merchant, who loaded 900 camels with it. Allowing only 800 lbs. weight to every camel (though ſome will carry 12 or 1300 lbs.) how many tons did the coloſſus weigh? *Anſ.* 321 tons, 8 cwt. 2 qrs. 8 lbs.

APOTHECARIES WEIGHT.

158. IN 27 lb. 7 oz. 2 drs. 1 ſcr. 2 grs. how many grains? *Anſ.* 159,022.

159. In 159,022 grains, how many pounds, ounces, drams, ſcruples, and grains? *Anſ.* 27 lb. 7 oz. 2 drs. 1 ſcr. 2 grs.

N. B. The company of apothecaries were incorporated by a charter from James I. procured at the ſolicitation of Dr. Mayerne and Dr. Atkins; till that time they only made a part of the grocers company; plums, ſugar, ſpice, Venice treacle, mithridate, &c. were ſold in the ſame ſhop, and by the ſame perſon. The reaſon of ſeparating them was, that medicines might be better prepared, and in oppoſition to divers perſons who impoſed unwholeſome remedies on the people. To his majeſty belong two apothecaries: the ſalary to the firſt £320, to the ſecond £275. To the houſehold belong alſo two. The firſt mention of an apothecary attending the king's perſon in England is about 1344, in the reign of

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(*c*) See queſtion 9th. et ſeq.

Edward

Edward III. who ſettled a penſion of 3*d*. per day for life, on Courſus de Gangeland, for having taken care of him during his illneſs in Scotland. By an act paſſed in the reign of queen Anne, apothecaries are exempted from ſerving ward and pariſh offices, or on juries.

There are but two apothecaries allowed in Copenhagen, the capital of Denmark, and only one in every other conſiderable town of that kingdom. In Ruſſia, we are told, there are no apothecaries at all; neither are there any phyſicians, except two or three retained by the court, and thoſe rather for ſtate than ſervice.

Travellers ſpeak of a famous apothecary's ſhop at Dreſden, furniſhed with 4,000 ſilver pots, all filled with the choiceſt drugs. And the diſpenſary, or apothecary's office at Loretto, is ſaid to contain upwards of 340 large gallipots of beautiful Faenza porcelain, exquiſitely painted with boys, bacchanals, &c. &c. by the famous Raphael. The Chineſe diſpenſe medicines gratis to all the poor who ſtand in need of any relief from phyſic.

CLOTH MEASURE.

160. IN 27 yards, how many nails? *Anſ.* 432.

161. In 75 ells Engliſh, how many yards? *Anſ.* 93 yds. 3 qrs.

162. In 24 pieces, each 32 Flemiſh ells, how many Engliſh ells? *Anſ.* 460 ells, 4 qrs.

163. In 27 pieces, each 27 Engliſh ells, how many yards? *Anſ.* 911 yards, 1 quarter.

164. In 27,851 yards, how many Engliſh ells? *Anſ.* 22,280 Engliſh ells, 4 qrs.

N. B. Fine linen is made from a fibrous plant called flax; and coarſe linen from a plant of the ſame kind denominated hemp. Theſe, however, are not the only materials that ſupply it: for a cloth is ſold at Leipſic, ſaid to be made of nettles; and, in Sweden, they fabricate a coarſe ſort from hop-binds, or hop-tops.

Linen is ſaid to have been firſt manufactured in England by Flemiſh weavers, under the protection of Henry III. in 1253; antecedent to

which æra, woollen ſhirts were the only ones worn in this country. In 1684, lord-deputy Wentworth eſtabliſhed the linen manufacture in Ireland, where it has been brought to a great degree of perfection. The ſame commodity is the ſtaple of Scotland; and the Ruſſians, Germans, Swiſs, Flemings, Hollanders, and French, are the principal European nations who traffic in it.

The uſe of linen is of very remote antiquity. Upon Joſeph's exaltation to the viceroyſhip of Egypt, veſtures of fine linen are marked as the principal ornaments of his ſtate attire (*d*). Indeed, from the frequent mention made of the Egyptian linen by the ancients, many learned men have been induced to aſſert, that it was of far ſuperior fineneſs and value to any of modern manufacture. Late inveſtigation has, however, evinced the fallacy of this aſſumption. For, when Dr. Hadley, in conjunction with other intelligent perſons, examined an Egyptian mummy, of which an account is given in the philoſophical tranſactions for 1764, they found the upper filletting ſcarce equal in fineneſs to what is ſold at preſent for 2*s*. 4*d*. a yard, under the name of long lawn; and the inner filletting, in general, ſtill coarſer. Now, there is every reaſon to ſuppoſe the linen in which the mummies were wrapped to have been the fineſt at that time in Egypt, becauſe embalming was only practiſed towards the remains of perſons of high diſtinction, at whoſe interment no charges were ſpared. Another ingenious writer (*e*) has alſo amply refuted the ſame notion by citations from authors and travellers of acknowledged credit, who had profeſſedly diſcuſſed, or occaſionally adverted to, the ſubject under conſideration. On the authority, therefore, of theſe accounts, and the force of the inferences deduced from them, we are warranted in affirming the Egyptian Linen to have been ſolely indebted for its celebrity to the comparative inferiority of every other, at the ſame period. That, however, other nations were by no means ſtrangers to the ſame manufacture, is with great probability inferred, by the valuable writer juſt alluded to, from the ſtory of Rahab, Joſh. ii. 6. as well as from the portrait of a virtuous Jewiſh matron, Prov. xxxi. 13, 24.

(*d*) Gen. ch. xli. 42.

(*e*) Harmer. See his excellent Obſervations on divers Paſſages of Scripture, Vol. II. page 349 et ſeq.

LONG MEASURE.

165. THE Atlantic ocean, which lies between Europe and America, is ſaid to be 1000 leagues acroſs: how many miles are in that ſpace? *Anſ.* 3000.

166. Volcano is a name given to burning mountains, or to vents for ſubterraneous fires that emit or eject flames, aſhes, cinders, ſtones, liquid ſulphur, and other ſubſtances. The principal apertures of this kind in Europe, are Etna in Sicily, Veſuvius in Naples, and Hecla in Iceland. The eruptions of flame and ſmoke from Etna are ſeen by thoſe who ſail on the Mediterranean, at the diſtance of 168 Engliſh miles: how many furlongs and poles do they contain? *Anſ.* 1,344 furl. 53,760 poles.

167. In the year 1536, Etna raged with ſuch peculiar violence, that it ſhook all Sicily, and diſgorged a great quantity of aſhes, which were not only diſperſed all over the iſland, but alſo carried beyond ſea to Italy, ſo that ſeveral ſhips, then on their paſſage to Venice, at 200 leagues diſtance, ſuffered damage. How many yards are in that ſpace? *Anſ.* 1,056,000.

N. B. The eruption of Etna, in 1669, deſtroyed 27,000 human habitations, and 17,000 perſons periſhed by it in Catania.

168. In the year 79 occurred the firſt eruption of Veſuvius on record. It happened in the time of Veſpaſian, when Pliny the elder, a celebrated lawyer and natural philoſopher, having been prompted by curioſity, to obſerve its effects, was ſuffocated with the ſulphureous ſmoke. Herculaneum was alſo overwhelmed at the ſame time, and, like Pompeii and other cities, was thought to have been utterly deſtroyed, till the beginning of the preſent century, when it was diſcovered, and many of the houſes were found perfectly furniſhed, with the furniture in good preſervation. It is ſituated 8 miles from Naples. How many inches and barley-corns are in that ſpace? *Anſ.* 506,880 inches, 1,520,640 barley-corns.

169. How many times does a wheel of 7 feet in circumference turn round in going a mile? *Anſ.* 754$\frac{3}{7}$.

170. The equatorial circumference of the earth being 360 degrees, how many barley-corns will encompaſs it? *Anſ.* 4,755,801,600.

171. At Derby there is a wonderful machine, the only one of its kind in England. It is an engine for making organzine or thrown ſilk, by which invention one perſon can twiſt as much ſilk as could be performed by fifty in the uſual way, and that in a truer and better manner. The model of this celebrated piece of mechaniſm is ſaid to have been clandeſtinely taken by the brother of the late Sir Thomas Lombe, merchant of London, from the original in the king of Sardinia's dominions, about the year 1714. The two brothers acting in concert employed an excellent mechanic, called Soracle, and completed the whole machinery, which has greatly encouraged the ſilk manufacture of this kingdom, and ſaved a great deal of money to the nation, formerly paid to the Piedmonteſe for organzine ſilk. This grand machine contains 26,586 wheels, and 97,746 movements, and one water-wheel communicates motion to all the reſt of the wheels and movements, of which any one may be ſtopped ſeparately and independently of the reſt. One fire engine conveys air to every part of the machine; and one regulator governs the whole; 73,728 yards of ſilk are wound every time the water-wheel goes round, which is three times in a minute; ſo that 318,504,960 yards may be wound in 24 hours: how many miles and leagues are contained in this quantity? *Anſ.* 180,968 miles, 1,280 yards; 60,322 leagues, 2 miles.

N. B. 1760 yards make a mile.

172. About 217 years B. C. Hannibal, the renowned Carthaginian general, ſet out from New Carthage in Spain, to invade Italy(*f*). From this city to the plains of Italy the diſtance is computed at 1000 miles. How many inches are in that ſpace? *Anſ.* 63,360,000.

N. B. Hannibal, in this march, croſſed the Pyrenean hills; the river Rhone, near Avignon, in France; and the Alps. In traverſing thoſe high mountains he encountered extreme fatigue, and loſt a conſiderable part of his army. This invaſion was productive of innumerable diſaſters and almoſt total ruin to the Roman ſtate. He defeated their numerous forces (always with prodigious ſlaughter) near the river Ticinus; the Trebia; near the lake Thraſymenus; and, finally, near Cannæ, the moſt memorable of his victories, and moſt fatal to his enemies. Being, at length, recalled to defend his own country, he was there defeated by Scipio. Soon after this overthrow, he ſought an aſylum with Pruſſias, king of Bythinia, who, deſirous to gratify the Romans, deſigned to be-

(*f*) Rollin's Ancient Hiſt. Vol. I.

tray

tray him into their hands; to avoid which diſgrace, Hannibal poiſoned himſelf, in the 70th year of his age; enjoying at his death the reputation of having been one of the greateſt commanders the world had produced; a teſtimony confirmed to our time by the unanimous voice of poſterity.

173. The national debt amounted, in 1786, to £239,154,879 ſterling. Suppoſe this enormous ſum counted in ſhillings, each meaſuring an inch in breadth, and all placed in contact with each other's edges, what length of line would they require? *Anſ.* 75,490 Engliſh miles; a ſpace exceeding the circumference of our earth 430 miles more than three times, excluſive of 1,421 yards, 2 feet, which remain.

174. The battle of Cunaxa, a place ſituated about 25 leagues N. W. of Babylon, is highly diſtinguiſhed in ancient hiſtory. It was fought about 401 years B. C. between young Cyrus and his brother Artaxerxes. The latter having ſucceeded to the Perſian throne on the death of Darius Nothus his father, the former, aided by ſome Grecian troops, attempting to dethrone him, was ſlain in this engagement, which, however, owes almoſt the whole of its celebrity to the retreat of the 10,000 Greeks, that immediately ſucceeded it, and is one of the moſt memorable events in hiſtory. Thoſe able and intrepid warriors, hopeleſs of ſuccour, bereft of their principal commanders, deſtitute of allies, proviſions, money, horſes, and archers, with, in fine, no reſource but the prudence and valour which love of liberty, and impatience to be reſtored to their native country inſpired, traverſed five or ſix hundred leagues interſected by vaſt rivers, and obſtructed by innumerable defiles. Yet they proceeded through various fierce and barbarous nations, ſurmounted all the obſtacles and dangers that aroſe at every ſtep, and, in a word, accompliſhed their unutterably arduous enterprize, after repeated triumphs over toils, neceſſities, fraud, and force. This retreat is eſteemed the boldeſt and beſt-conducted exploit on record. It is minutely narrated by the admired hiſtorian Xenophon, whoſe melody of periods, and elegance of diction obtained for him the appellation of *Attic Bee*. He, as Rollin obſerves (*g*), was not only a ſpectator of the facts he relates, but the prime mover and animating ſpirit of the whole expedition. Admitting the diſtance from Cunaxa, the place of engagement, to Cotyora, near Ceraſus and Trapeſond, on the coaſt of the black ſea, where the 10,000 embarked, to be 600 leagues, how many inches and barley-corns are in that ſpace? *Anſ.* 114,048,000 inches, 342,144,000 barley-corns.

(*g*) Ancient Hiſt. Vol. III.

N. B.

N. B. Ceraſus, juſt mentioned, became famous for the cherry-trees which Lucullus firſt brought from that city into Italy, and which have thence been diſperſed over the weſtern world.

LAND MEASURE.

175. THE pyramids of Egypt are ſome of the moſt ancient ſtructures on our earth (*h*). They are generally ſuppoſed to have been deſigned as places of ſepulture for the Egyptian kings, though others contend they ſerved for altars and temples, and were conſtructed in honour of the Deity. The charge of building them was immenſe. According to Herodotus 100,000 workmen were employed for 30 years without intermiſſion in preparing the materials, or conſtructing the work, and he adds that 1,600 talents of ſilver were expended in radiſhes, onions, and garlic by the workmen; a ſum equal, according to different calculations, to about £400,000, £289,379, or, at leaſt, £220,000 ſterling. Three of theſe magnificent ſtructures yet remain. The perpendicular height of the largeſt is 500 feet, and its baſe covers eleven acres of ground. How many perches are in this quantity? *Anſ.* 1760.

176. The whole territory of the United States of America is ſaid to contain by computation a million of ſquare miles, in which are 640 millions of acres. Of theſe 51 millions are water; deducting theſe, what number of acres, roods, and perches of land do the United States contain? *Anſ.* 589,000,000 acres, 2,356,000,000 roods, 94,240,000,000 perches.

177. Political writers greatly vary in their accounts of the quantity of land in England. Dr. Grew makes the number of acres amount to upwards of 46 millions. Sir William Petty reckons but 28, others eſtimate them at 29 millions; and Dr. Davenant ſtates the quantity of land in England and Wales to be 39 millions of acres. Zimmerman ſuppoſes that England contains about 42 millions of acres: how many roods and perches are in that quantity? *Anſ.* 168,000,000 roods, 6,720,000,000 perches.

N. B. Only 8,500,000 acres produce corn; the reſt is either covered with wood, or laid out in meadows, gardens, parks, &c. and a conſi-

(*h*) See queſtions 9 and 157.

derable

derable part is ſtill waſte land. The net produce of the Engliſh corn-land is eſtimated by Mr. Young at £9,000,000, ſterling; the rents of paſture-ground, meadows, woods, commons, &c. at £7,000,000, the number of people engaged in and maintained by farming is ſtated by him to amount to 2,800,000 perſons. An acre contains 4 ſquare roods or 160 ſquare poles or perches. By the cuſtom of countries the perch differs in quantity, and of conſequence the acres of land: it is commonly but 16½ feet, but in Staffordſhire it is 24 feet. An acre alſo, by computation, is 10 ſquare chains of 22 yards each, that is 4,840 ſquare yards; and a mile being 1,760 yards ſquare, a mile ſquare will be found to contain 640 acres.

DRY MEASURE.

178. IN 120 quarters of wheat how many quarts? *Anſ.* 30,720.

179. In 30,720 quarts, how many gallons, pecks, buſhels, and quarters? *Anſ.* 7,680 gallons, 3,840 pecks, 960 buſhels, 120 quarters.

180. Anderſon's hiſtory of commerce fixes the introduction of Newcaſtle coal into the capital in the year 1305. The quantity annually imported into London, deduced from an eſtimate of 10 years, viz. from 1770 to 1779, is 658,853 chaldrons. How many buſhels and pecks are in that quantity? *Anſ.* 23,718,708 buſhels, 94,874,832 pecks.

N. B. The firſt public mention of coal met with was in the year 1232, when king Henry III. confirmed the charter granted by John his father, to the inhabitants of Newcaſtle, to dig coals in the common ſoil without the walls, and to convert them to their own profit, in aid of their *fee-farm* rent of £100 per annum. The meaſure whereby coal is ſold in London is the chaldron, containing 36 buſhels; but in ſeveral parts of the country it is diſpoſed of by weight at ſo much per ton, cwt. &c.

181. It has been computed that the arable lands ſown with wheat in England, produce 34,000,000 buſhels of that grain annually; how many quarters, weys, and laſts, are in that quantity? *Anſ* 4,250,000 quarters, 850,000 weys, 425,000 laſts.

N. B. The quantity of barley produced in England is ſuppoſed to be much greater than that of wheat.

WINE

WINE MEASURE.

182. IN 5 tuns of wine, how many gallons? *Anſ.* 1,260.

183. In 10,080 pints, how many hogſheads? *Anſ.* 20.

184. The great tun or Rheniſh wine veſſel of Heidelberg, in Germany, which was made in 1343, contained about 21 pipes of wine; how many gallons and quarts did it hold? *Anſ.* 2,666 gallons, 10,664 quarts.

185. Another tun was conſtructed, or the before-mentioned one rebuilt in 1664, which held 600 hogſheads Engliſh meaſure. This was emptied and knocked to pieces by the French in 1688. But the elector Charles Lewis cauſed a new and larger one to be made, which, according to Salmon, holds 800 hogſheads. The electors have had frequent carouſals on the platform of it. How many pints does this celebrated veſſel contain; *Anſ.* 403,200.

186. The firſt miracle recorded of our Saviour Jeſus Chriſt was performed to grace a NUPTIAL SOLEMNITY, and, as that eminent critic Dr. Doddridge juſtly obſerves (*i*), was in effect a teſtimony borne to the honour and purity of that happy ſtate, on which ſo much of the comfort of the preſent generation, and the exiſtence of the future, regularly depends. This candid and learned writer further remarks on this tranſaction, that the ſocial and obliging temper of our Saviour ſhould ſweeten ours, and be a leſſon to his followers, that they avoid every thing ſour and moroſe, and do not cenſure others for innocent liberties at proper ſeaſons of feſtivity and joy.

So inaccurate and uncertain are our eſtimates of the meaſures of the ancients, that it is ſcarce poſſible to determine the exact contents of the veſſels which held the water mentioned, John ii. 6 et ſeq. Some have computed them to contain two or three hogſheads, and our tranſlation

(*i*) Family Expoſitor, Vol. I. Sect. 23.

makes

makes their contents above 100 gallons. The Greek word ſignifies, as Dr. Doddridge obſerves, no more than *meaſures*, and as the Jewiſh bath was the moſt common meaſure in liquids, he conjectures this the quantity deſigned where meaſures are expreſſed without limitation. The Jewiſh bath is reckoned to contain $4\frac{1}{2}$ gallons. Suppoſing the veſſels or jars in queſtion to have held two meaſures each, how many gallons, quarts, and pints did the ſix contain? *Anſ.* 54 gallons, 216 quarts, 432 pints.

Marriage feaſts among the Jews were generally protracted for ſeveral days, Gen. xxix. 27, 28; and Judg. xiv. 12, 17.

N. B. Wine is defined a briſk, agreeable, ſpirituous, and cordial liquor, extracted from vegetable bodies, and fermented. All ſorts of vegetables, fruits, ſeeds, roots, &c. may be made to afford it; as grapes, pulſe, peas, turnips, radiſhes, and even graſs. The word wine is, however, appropriated, in a more particular manner, to the fermented juice of the grape. Of this various ſorts are made in France, Germany, Spain, Portugal, Hungary, and Italy. Wine is of extenſive utility, not only as a beverage, but as a medicine; and ſeveral eminent phyſicians recommend it as an excellent cordial, peculiarly ſalutary in fevers, &c. Among the Romans, the age of wines was in a manner the criterion of their goodneſs. Horace, in his odes, boaſts of his drinking Falernian wine, born, as it were, with him, or which reckoned its age from the ſame conſuls. Pliny mentions ſome that had been kept above 100 years, and was ſtill potable. He ſpeaks of others, which, at the expiration of 200 years, were reduced to the conſiſtence of honey. But the moderns keep no wines to any ſuch age; for in Italy and Germany where they are longeſt preſerved, ſcarce any are found above 15 years old. In France, the beſt keeping wines are reckoned ſuperannuated in 5 or 6 years.

Several of the ancients thought that the antediluvians were utterly unacquainted with wine; Noah being, in their opinion, the firſt who uſed that liquor. If, ſay they, wine had been known anterior to the flood, Abel would not have omitted offering ſome to the Lord, and Noah would have been guarded againſt drinking of it to exceſs. But others contend, that ſo little probable is it that the firſt men were ſtrangers to a liquor ſo palatable and of ſuch eminent utility, that Adam himſelf ſhould not be ſuppoſed unacquainted with it. Now, with reſpect to Noah's accident (*k*), they obſerve, that many natural and exculpatory ſolutions may be offered for it, without having recourſe to the total ignorance

(*k*) Gen. ix. 21.

inſiſted upon in the objection. Might he not have perfectly known the intoxicating quality of wine, yet miſtake the degree of its potency? Might he not imagine the quantity himſelf had taken not competent to cauſe the inebriation which actually enſued?

Though there were many excellent vineyards in Paleſtine, as is inferred from Gen. xlix. 11, yet prieſts were prohibited the uſe of wine, during the whole time of their miniſtration in the tabernacle, and ſervice at the altar, Lev. x. 9.

Drunkenneſs, in itſelf a very unſeemly offence, becomes ſo ſcandalous an enormity when a miniſter is the tranſgreſſor, eſpecially during his adminiſtration of ſacred things, that nothing is more natural than to find the uſe of wine altogether prohibited at ſuch ſeaſons. Nazarites are ſubjected to a ſimilar reſtriction, Numb. vi. 3. In ancient times, it was cuſtomary to adminiſter wine for the alleviation of affliction (*l*); and the rabbins affirm, that criminals were ſupplied with *that* and other ſtrong liquors, immediately previous to their execution, to moderate the agony of apprehenſion and diminiſh the ſenſation of pain. The ſame writers further acquaint us, that certain females at Jeruſalem, accuſtomed themſelves, through motives of charity, to mingle with wine ſome drugs, which, by augmenting its ſtrength, better adapted it to the juſt mentioned purpoſes. Many think, ſuch to have been the potion preſented to our Saviour, at the moment of his crucifixion, Mark xv. 23.

In the reign of Edward VI. French wines were ſold at 4*d.* 8*d.* and, the beſt, at 12*d.* per gallon; and, in the ſame monarch's reign, the uſe of it was reſtricted to thoſe of noble birth, or who were in opulent circumſtances, others not being permitted to keep more than 10 gallons, for the immediate occaſions of their reſpective families, under a penalty of 10*l.* Neither did vintners at that period enjoy toleration to vend that article for conſumption in their habitations.

(*l*) Prov. xxxi. 6.

ALE AND BEER MEASURE.

187. IN 34 barrels of beer, how many gallons? *Anſ.* 1,224.

188. In 10 barrels of ale, how many gallons and quarts? *Anſ.* 320 gallons, 1,280 quarts.

189. In 67 butts of porter, how many gallons? *Anſ.* 7,236.

190. Soon after the commencement of the American war, two brewers agreed to ſupply government with 10,000 butts of ſtrong beer for the uſe of our troops in Boſton; how many pints were in that quantity? *Anſ.* 8,640,000.

N. B. Ale and beer are fermented liquors obtained from an infuſion of malt; the former differing from the latter chiefly in having a leſs proportion of hops. This liquor, the natural ſubſtitute of wine, in countries that could not produce the grape, was originally made in Egypt, the firſt-planted kingdom, on the diſperſion from the eaſt, which was ſuppoſed unable to produce grapes. And as the Noachian colonies penetrated further into the weſt, they found, or thought they found, the ſame defect, and ſupplied it in the ſame manner. Thus the natives of Spain, the inhabitants of France, and the aborigines of Britain, all uſed an infuſion of barley for their ordinary liquor: and it was called by various names, all literally importing only *the ſtrong water*. The ancient Britons and other Celtic nations ſometimes made their ale of wheat, oats, and millet. This was the favourite liquor of the Anglo-Saxons and Danes, as it had been of their anceſtors, the ancient Germans. Of upwards of 34 millions of buſhels of barley, which England is ſuppoſed to produce annually, more than 23 millions are converted firſt into malt, and afterwards into ale and beer.

Hops were firſt brought into England from the Netherlands, in the year 1525. Prior to that period, wormwood is ſaid to have anſwered ſome of the purpoſes for which this balſamic and aperient bitter is now uſed. The conſumption of ale and beer in theſe kingdoms is incredibly great. It was computed 20 years ago at the annual value of 4 millions, including Great-Britain and Ireland. Certain it is, that the duties on thoſe liquors form a principal branch of the revenue in Britain.

TIME.

191. CALEDONIA was the ancient name of Scotland, whoſe king, James VI. ſucceeded to the throne of England, on the demiſe of queen Elizabeth, which acceſſion produced the union of the two crowns in 1603. In 1707, during queen Anne's reign, both kingdoms were alſo united, under the denomination of Great-Britain. How many years and days has this laſt beneficial event preceded the preſent year 1788? *Anſ.* 81 years, 29,585 days, 6 hours.

192. Blenheim, a village of Swabia in Germany, is rendered memorable by the victory the confederates, commanded by the duke of Marlborough and Prince Eugene, obtained there over the French and Bavarians, under the command of the duke of Bavaria and the marſhals Tallard and Marſin in 1704. How many years, months, weeks, days, and hours, have intervened to the preſent year 1788, reckoning 13 months, 1 day, 6 hours, to the year? *Anſ.* 84 years, 1,092 months, 4,368 weeks, 30,660 days, 736,344 hours.

N. B. Government erected the ſtately palace of Blenheim, near Woodſtock, Oxfordſhire, for the duke of Marlborough, in commemoration of this battle, which was ſucceeded, in 1706, 1708, and 1709, by the deciſive ones of Ramillies, Oudenarde, and Malplaquet, where the ſame duke ſtill proved victorious.

193. The illuſtrious Genoeſe, Chriſtopher Columbus, was the original diſcoverer of America, in 1492; though the Florentine Veſpucius Americanus, who did not reach that vaſt continent till 1497, or, as ſome ſay, 1499, arrogated to himſelf the high diſtinction of its diſcoverer: and being poſſeſſed of conſiderable literary talents, by publiſhing the firſt voyages on the ſubject, and other artful means, he had the addreſs to communicate his name to the whole hemiſphere. How many years and days are compriſed in the years which intervene between the diſcovery of the new world and the preſent 1788? *Anſ.* 296 years, 108,114 days.

N. B. Great part of North-America was colonized by Britiſh ſubjects, and formed part of the Britiſh empire. But thoſe SONS OF LIBERTY, as

as the late colonel Barré emphatically ſtyled them in the Engliſh houſe of commons, previous to the commencement of hoſtilities (*m*), finding their rights repeatedly invaded by ſeveral obnoxious and oppreſſive acts of the Britiſh parliament, at length took arms in 1775, and, after a glorious conteſt with the mother country of near eight years continuance, terminated the war in *Freedom*, *Security*, and *Independence*, under the command of GENERAL WASHINGTON, the great defender of the cauſe of liberty in the New World. The 13 provinces which had thus reſolutely united, and ſtrenuouſly fought to reſcue themſelves and poſterity from peculation and tyranny, are now known by the ſtyle of the UNITED STATES OF AMERICA; a title which all nations have admitted, and which various defeats and diſaſters at length compelled even Great-Britain to acknowledge in the moſt authentic manner, and with expreſſions and declarations that convey a full recognition of their independent ſovereignty.

The war, whoſe cauſe and iſſue we now curſorily mentioned, however juſtly undertaken and gloriouſly concluded on the part of the United States, has involved them in difficulties from which they cannot ſuddenly emerge. According to the report of the committee appointed for that purpoſe, the *Foreign Debt* incurred by them during the long conteſt, amounted to 7,885,085 dollars, and the *Domeſtic* to 34,115,290; the total, valuing each dollar at 4*s*. 6*d*. being equal to £9,450,084 ſterling; the intereſt of which, at 6 per cent. ſubjects them to the annual diſburſement of £567,005. But the charges of the ſame war to the *debt-ſtrangled* kingdom of England are moderately computed at £115,654,914, which enormous principal, ſince January 1775, requires a proviſion of £4,557,575, for the annual liquidation of its intereſt (*n*).

The loſs of men on each ſide, though a more reparable, is not a leſs deplorable evil. According to authentic eſtimates, there periſhed by the ſword, fatigue, and confinement, near 80,000 Americans; and, by the returns at New-York, the number of Britiſh killed in the ſervice, amounted to 43,633.

194. An earthquake is a vehement ſhake or agitation of ſome conſiderable place, or part of the earth, from natural cauſes, attended with a tremendous noiſe like thunder, and frequently with an eruption of water or fire, or elſe of ſmoke or wind. Earthquakes are reputed the greateſt

(*m*) Dr. Gordon's valuable Hiſtory of the American Revolution, Vol. I. P. 160, 167.

(*n*) For the whole amount of the national debt in 1786, ſee queſtion 132.

and

and moſt formidable of nature's phenomena. The Philoſophical Tranſactions furniſh us with abundance of hiſtories of them. Some of the moſt terrible are,—that of Catania, in Sicily, in 1692, when upwards of 60,000 perſons loſt their lives there and in the neighbouring towns and villages;—that which deſtroyed Port-Royal, in Jamaica, in 1692, when 2,000 people periſhed, and 3,000 more were ſhortly after ſwept away by a general ſickneſs, the conſequence of the earthquake;—that at Lima, in 1687, when 5,000 perſons were deſtroyed; and another at the ſame place, and the port of Callao, in 1746, which deſtroyed moſt of the inhabitants, and ſwallowed up ſeveral ſhips then in the port;—that at Liſbon, in 1755, when 60,000 perſons periſhed; and, laſtly, that in Calabria and Sicily, in the beginning of the year 1783, which deſtroyed many cities and villages, and above 40,000 inhabitants. How many moments have elapſed between this laſt and the ſame period in the year 1789? *Anſ.* 189,345,600.

N. B. England has had ſeveral ſhocks of earthquakes. Concerning the cauſes of thoſe viſitations naturaliſts are greatly divided: ſome aſcribe them to water, others to fire, and others again to air; all ſupporting their diſcordant ſyſtems with ingenious and ſpecious reaſoning. But the theory of earthquakes has received conſiderable alteration and improvement from modern electrical diſcoveries; and ſeveral ingenious philoſophers, with great plauſibility, now impute them to electrical phenomena. Of this number is the juſtly celebrated Dr. Prieſtly, to whoſe Hiſtory of Electricity we refer the reader.

195. That accompliſhed ſeaman and great practical philoſopher, Captain Cooke, who had thrice circumnavigated the globe, who had explored the utmoſt navigable limits of the ocean, whoſe frame had endured the tropical heat and the polar cold, fell a ſacrifice at laſt to the momentary fury of a nameleſs ſavage. This direful event happened on the 14th of February 1779, at Owhyhee, one of the Sandwich Iſlands. How many minutes are contained between that day and the 14th of Feb. 1789? *Anſ.* 5,259,600.

N. B. The earth has been frequently circumnavigated; firſt, in the year 1519, when Magellan is ſaid to have made the tour of the whole globe in 1,124 days; though others aſſert, that he did not live to perform the whole voyage, having been killed in one of the Philippine Iſlands. In the year 1557, our countryman Drake accompliſhed the ſame arduous undertaking in 1,056 days. In the year 1586, Sir Thomas Cavendiſh made the ſame voyage in 777 days; and many others have ſince performed

the

the ſame navigation; among the reſt our countryman Lord Anſon. See queſtion 108.

196. How much time, in the courſe of 40 years, does a perſon, who riſes at 5 o'clock in the morning, gain over another, who lies in bed till 7, ſuppoſing them both to go to reſt at the ſame hour at night? *Anſ.* 29,200 hours, or 3 years, 121 days, and 16 hours; which, reckoning only 365 days to the year, is exactly equivalent to the addition of ten years to a man's life, of which (ſuppoſing the 2 hours in queſtion to be ſo ſpent) 8 hours every day ſhould be employed in ſtudy and devotion. Dr. Doddridge's Fam. Expoſ. Vol. IV. Sect. 29, where the Doctor remarks, that he found this obſervation of ſuch vaſt importance to himſelf, that he aſcribes the production of almoſt all his writings to the practical uſe of it.

Perſons not accuſtomed to accuracy and minuteneſs of calculation, will hence learn with ſurpriſe the vaſt ſpace of time gained by moderation in ſleep, or, in other words, how conſiderably early riſing will extend life in a given number of years. The advantages of this habit muſt, indeed, be very numerous: ſince, as the pious Hervey obſerves (*o*), divine and human wiſdom, the ſcriptures and the claſſics, are found to concur in frequent recommendations of it. Not to advert to ſolitary paſſages to this effect in other tracts of holy writ, ſeveral of Solomon's proverbs, while inveighing againſt ſloth, or extolling diligence, make the time ſpent in the repoſe of ſleep, the principal evidence of the former vice, or teſt of the latter excellence.

As an engagement to name all the eminent perſons who diſtinguiſhed themſelves by a perpetual conflict againſt ſomnolency, would imply little leſs than the mention of all the great and good characters that have appeared ſince the creation, we ſhall content ourſelves with acquainting our young readers with the excellent Alfred's diſtribution of his time. This illuſtrious Engliſh monarch divided that invaluable treaſure into three different portions, allotting one to ſleep, meals, and exerciſe; and devoting the other two to writing, reading, buſineſs, and prayer (*p*).

Theſe curſory reflections cannot more aptly conclude than with the vivacious admonition to rigid economy of time, by the late penetrating Young:

" ———————————— moments ſeize.
" Heav'n's on their wing: a moment we may wiſh,
" When worlds want wealth to buy (*q*)."

(*o*) Reflections on a Flower-Garden. (*p*) Smollet's Hiſtory of England.
(*q*) Night II. in which are many appoſite reflections on the ſame ſubject.

Time

Time is defined to be a ſucceſſion of phenomena in the univerſe, or a mode of duration, marked by certain periods and meaſures, chiefly by the motion and revolution of the ſun. The idea of time in general, we acquire, as Mr. Locke obſerves, by conſidering any part of infinite duration, as ſet out by periodical meaſures. The idea of any particular time, or length of duration, as a day, an hour, &c. we acquire firſt by obſerving certain appearances at regular, and, ſeemingly, equidiſtant periods.

Some authors diſtinguiſh time into aſtronomical and civil: the former being *that* taken purely from the motion of the heavenly bodies, without any other regard. The latter is aſtronomical time, accommodated to civil uſes, and formed and diſtinguiſhed into years, months, days, &c. Time makes the ſubject of CHRONOLOGY (*r*).

THE RULE OF THREE DIRECT

TEACHES, by having three terms given, to find a fourth that ſhall have the ſame proportion to the third, as the ſecond has to the firſt.

RULE.

Firſt. State the queſtion: that is, place the given numbers ſo that the firſt and third may be terms of ſuppoſition and demand, and the ſecond of the ſame kind as the anſwer required.

Secondly. Bring the firſt and third numbers into the ſame denomination, and the ſecond into the loweſt name mentioned.

Thirdly. Multiply the ſecond and third numbers together, and divide the product by the firſt, the quotient will be the anſwer to the queſtion in the ſame denomination as that in which the ſecond number was left.

N. B. The *Rule of Three*, from its vaſt extent, both in common life, and the ſciences, is frequently called the *Golden Rule*.

EXAMPLES.

197. What is the value of a cwt. of ſugar, at $5\frac{1}{2}d$ per lb.? *Anſ.* £2 11s 4*d*.

(*r*) See queſtion 33.

198. What

198. What is a chaldron of coal worth, at $11\frac{1}{2}d$ per buſhel? *Anſ.* £1 14*s.* 6*d.*

199. At $10\frac{1}{2}d$ per lb. what is the value of a firkin of butter, weighing 56 lb.? *Anſ.* £2 9*s.*

200. What is the value of a pipe of wine, at $10\frac{1}{2}d$ per pint? *Anſ.* £44 2*s.*

201. If 4 ells coſt 19*s.* what are 32 ells worth? *Anſ.* £7 12*s.*

202. If 3 yards coſt 18*s.* what are 34 yards worth? *Anſ.* £10 4*s.*

203. If 9 lb. of ſugar coſt 6*s.* what is the value of 27 lb. $\frac{1}{4}$? *Anſ.* 18*s.* 2*d.*

204. If 7 lb. $\frac{3}{4}$ of ſugar coſt 4*s.* what will 69 lb. $\frac{3}{4}$ come to? *Anſ.* £1 16*s.*

205. If 2 ounces of tea coſt 11*d.* what will 9 lb. come to? *Anſ.* £3 6*s.*

206. If a ſervant's wages be £12 12*s.* for 52 weeks, how much is that per week? *Anſ.* 4*s.* 10*d.* $\frac{32}{52}$.

207. If 52 weeks wages be £39, what would 14 weeks come to? *Anſ.* £10 10*s.*

208. At £9 per annum, what do 10 weeks wages amount to? *Anſ.* £1 14*s.* $7\frac{1}{4}d$..

209. If a ſervant receives £2 12*s.* 6*d.* for 13 Weeks wages, how much is that per annum? *Anſ.* £10 10*s.*

210. If 1 cwt. of ſugar coſt £3 14*s.* 8*d.* what is that per lb.? *Anſ.* 8*d.*

211. If a chaldron of coal be bought for £2, how much is that per buſhel? *Anſ.* 1*s.* $1\frac{1}{4}d$.

212. If a pipe of wine coſt £27 0*s.* 9*d.* how much is that per gallon? *Anſ.* 4*s.* $3\frac{1}{2}d$.

213. At $8\frac{1}{4}d.$ per lb. what muſt be paid for a ſtitch of bacon, weighing 65 lb. $\frac{3}{4}$? *Anſ.* £2 5*s.* $2\frac{1}{4}d.$

214. If 3 lb. $\frac{1}{2}$ of cheeſe coſt 1*s.* 1*d.* what is that per cwt.? *Anſ.* £1 14*s.* 8*d.*

215. Some apprehend the 30 pieces of ſilver, which Judas received as the reward of his treachery to the appointed Saviour of the world (*f*), to have been 30 ſhekels; others that they were 30 denarii, or Roman pence. Eſtimating the former at 2*s.* 6*d.* each, and the latter at $7\frac{1}{2}d.$ which is the uſual valuation, how much did the traitor receive according to each of theſe ſuppputations? *Anſ.* £3 15*s.* if ſhekels;—18*s.* 9*d.* if denarii.

N. B. Some, however, value the ſhekel at 2*s.* $9\frac{1}{2}d.$ and others, at 2*s.* $3\frac{3}{38}d.$ ſterling; and the Roman denarius is valued from 6*d.* to $8\frac{1}{2}d.$ ſterling.

216. Spikenard is an odoriferous plant abounding in the iſland of Java and other parts of the Eaſt-Indies. Its ointment was in high eſtimation among the ancients. The evangeliſt Mark, chap. xiv. ver. 3. relates, that while our Saviour ſat at table in the houſe of Simon the leper in Bethany, a village near Jeruſalem, a woman entered with an alabaſter pot of ointment of ſpikenard, which having broken, ſhe poured the contents on his head. Suppoſing a Roman denarius or penny to be worth $7\frac{1}{2}d.$ of our money, what was the value of this unguent, which, ver. 5, was eſtimated at 300 ſuch pence? *Anſ.* £9 7*s.* 6*d.* ſterling.

N. B. Dr. Whitby has abundantly proved this to have been a different ſtory from that mentioned, Luke vii. 36, et ſeq.

217. The cotton-manufacture is, next to the woollen, the principal one in this kingdom. In the northern and middle counties it is ſaid to employ 500,000 perſons, including women and children. Suppoſing they are paid on an average 2*s.* 6*d.* a week each, what is the annual amount of their earning? *Anſ.* £3,250,000.

N. B. Cotton is a plant of which there are ſeveral varieties, and not a few diſtinct ſpecies, propagated in the gardens of the curious in England. The common ſort is the herby or ſhrubby cotton, which is cultivated very plentifully in Candia, Lemnos, Cyprus, Malta, Sicily, Naples,

(*f*) Matth. xxvi. 15.

and

and alſo between Jeruſalem and Damaſcus, from whence it is brought annually into theſe northern parts of Europe. Cotton is likewiſe a native of the Eaſt and Weſt-Indies.

218. The books belonging to the ſorcerers at Epheſus, which they voluntarily deſtroyed, in conſequence of the apoſtle Paul's preaching, were valued (*t*) at 50,000 pieces of ſilver, which are computed by Dr. Benſon to have been worth £7,500; by another critic £6,250; and by Dr. Prideaux, £1,875 ſterling, what is the value of each piece of ſilver, according to theſe ſeveral calculations? *Anſ.* 3*s.*—2*s.* 6*d.*—9*d.*

219. The ſtate lottery propoſed by Mr. Pitt for the preſent year 1788, is to conſiſt of 48,000 tickets, at £15 12*s.* 9*d.* each, and £480,000 are to be diſtributed into prizes. Eſtimating the expences of drawing the lottery at £10,600, how much will government gain by it? *Anſ.* £260,000.

220. The table of Lucullus was ſuppoſed to be the moſt ſplendidly ſerved of any in Rome. His ſervants, upon being apprized of the apartment in which he deſigned to ſup, regulated the order, quantity, quality, and expence of the banquet accordingly. The charges of an accidental entertainment made by him for Cicero and Pompey, becauſe ordered in the Apollo, amounted to 50,000 drachms of ſilver; a ſum ſaid to be equal to £1,250 ſterling. What was the value of each drachm? *Anſ.* 6*d.*

N. B. Drachm, or drachma, was an old Roman coin, the eighth part of an ounce.

221. England is noted for the excellency of its cheeſe. Camden and others ſuppoſe that we learnt the art of making it from the Romans. Chedder in Somerſetſhire, and Stilton in Huntingdonſhire, are famed for an exquiſite ſort, which is ſaid to be ſuperior to any in Europe, except the Parmeſan. The counties of Wilts, Glouceſter, Warwick, and Cheſhire, make immenſe quantities of cheeſe; of which Cheſter alone annually exports 22,000 tons. How much are they worth at 4½*d.* per lb.? *Anſ.* £975,333 6*s.* 8*d.*

222. Wool is very juſtly held the grand ſtaple commodity of this kingdom, ſince the annual value of exported goods of that manufacture is eſtimated at nearly £4,000,000 ſterling. Admitting, with the general computation, that England maintains about 12,000,000 of ſheep, and

(*t*) Acts xix. 19.

eſtimating each fleece at 2*s.* what is the yearly value of Engliſh wool? *Anſ* £1,200,000

223. The woollen manufacture makes the principal article of our foreign and domeſtic trade. This important branch of commerce received conſiderable improvement in the reign of Edward III. by means of perſons whom that monarch invited from the Netherlands in the year 1331. The rigor with which the duke of Alva and the Spaniſh inquiſition proceeded againſt thoſe who had lately abandoned the doctrine and communion of the Roman church in that country, greatly contributed to the perfection of this valuable manufacture in the reign of queen Elizabeth, at which time many large manufactures were eſtabliſhed at Norwich, Colcheſter, &c. It is computed that 1,500,000 people are employed in the Britiſh woollen manufacture. Suppoſing each of theſe to earn, one with another, 6*d.* per *working* day, how much will their labour amount to in a year? *Anſ.* £11,737,500.

224. Herrings are ſuppoſed to reſide during winter within the arctic circle, near the north pole. They migrate ſouthward, towards the Britiſh coaſts, about June, in prodigious numbers, and form a principal article of commerce; 40,000,000 having been cured in one year in the port of Yarmouth alone. What was the value of the whole at 3*d.* per dozen? *Anſ.* £41,666 13*s.* 4*d.*

N. B. Pilchards, another ſmall ſalt-water fiſh of paſſage, are taken on our coaſts in vaſt quantities. The number obtained at one ſhooting out of the nets is amazingly great. In 1767, there were at one time encloſed in St. Ives's bay, Cornwall, 7,000 hogſheads, each containing 35,000 fiſh; in all 245,000,000. It is a ſaying of the Corniſh men, with regard to the pilchard, that it is the leaſt fiſh in ſize, moſt in number, and greateſt in gain, of any they take out of the ſea: an obſervation ſaid to be amply confirmed by Dr. Borlaſe's account of this fiſhery. Pilchards abound in the Mediterranean.

225. Corinth was taken and burnt by Mummius the Roman conſul 146 years B. C. (*u*). It is ſituated in the Morea, Turkey in Europe, and was, in a great meaſure, rebuilt and repeopled by Julius Cæſar. At the time of its capture, all the liberal arts had arrived at the higheſt perfection there. It contained more vaſes of all ſorts of metals, more finiſhed

(*u*) See queſtion 20.

paintings,

paintings, and ſtatues of the greateſt maſters, than any place in the world. When the ſpoils of Corinth were put up to ſale, Attalus, king of Pergamus, offered 600,000 ſeſterces for a Bacchus painted by Ariſtides, who was contemporary with Apelles. Valuing each ſeſterce at 2*d.* ſterling, how much of our currency was that exquiſite piece thought worth? *Anſ.* £5,000.

226. Tea is a plant or ſhrub indigenous to China in Aſia. It is a received opinion that the green and bohea tea grows upon the ſame ſhrub; but that the latters admits of ſome kind of preparation, which removes its raking qualities, and gives it a deeper colour. This faſhionable commodity was firſt brought into Europe by the Dutch in 1610, and into England by lord Arlington and lord Oſſory from Holland about the year 1666, at which period it was ſold for 60*s.* a pound. But it appears that, before this time, the drinking of tea, even in public coffee-houſes, in this country was not uncommon; for in 1660, a duty of 8d per gallon was laid on the liquor made from it, and ſold in all coffee-houſes. The preſent conſumption of tea is immenſe; it being computed by Zimmerman, in his Political Survey of Europe, that there are no leſs than 189,000,000 lb. exported annually from China into Europe. This reſpectable writer is, however, ſuppoſed to be miſinformed in this particular, as perſons converſant in the tea trade affirm, that the Britannic kingdoms conſume nearly as much tea as all Europe beſide; and 20,000,000 lb. are conjectured to be the greateſt quantity yearly expended in the Britiſh dominions: of theſe, two millions are ſuppoſed to be ſmuggled, and eighteen millions to be ſold by the Eaſt-India company. What is the value of the laſt-mentioned quantity, at only 5*s.* 9*d.* per lb.? *Anſ.* £5,175,000.

N. B. Before the commutation tax took place, the Eaſt-India company, it is ſaid, ſold only about 6,000,000 lb. annually.

Coffee has been familiar in Europe for more than 100 years, and among the Turks for 250. Its original is not well known, but it ſeems to have been firſt brought into vogue at Aden, a city near the mouth of the Red Sea. Hence it paſſed to Mecca. From Arabia Felix it was conveyed to Cairo. From Egypt it paſſed to Syria and Conſtantinople. Thevenot, the traveller, was the firſt who brought it into France; and a Greek ſervant, called Peſqua, brought into England by Mr. Daniel Edwards, a Turkey merchant, in 1652, to make his coffee, firſt ſet up the profeſſion of coffee-man, and introduced the drink among us. That from the Levant is more eſteemed than that from Mocha; and the Weſt-India coffee is held greatly inferior even to the latter.

THE RULE OF THREE INVERSE

TEACHES, by having three numbers given, to find a fourth, that ſhall have the ſame proportion to the ſecond as the third has to the firſt, in an inverted order.

RULE.

State and reduce the terms as in the preceding rule: multiply the firſt and ſecond terms together, and divide their product by the third; the quotient will be the anſwer to the queſtion in the ſame denomination as that in which the ſecond term was left.

EXAMPLES.

227. If 36 men can perform a piece of work in 12 days, how many days would 27 men require to complete the ſame? *Anſ.* 16 days.

228. What quantity of ſhalloon that is 3 quarters of a yard wide, will line 7 ½ yards of cloth that is 1 ½ yard wide? *Anſ.* 15 yards.

229. If 100 workmen can finiſh a piece of work in 24 days, how many are ſufficient to do the ſame in 6 days? *Anſ.* 400.

230. How many yards of linen, ell-wide, are equal to 19 yards of linen that is yard-wide? *Anſ.* 15 yds. 0 qrs. 3 n. ⅕.

231. If a perſon lend another the ſum of £200 for 12 months, how many months ſhould the latter lend the former £150, to requite the obligation? *Anſ.* 16 months.

232. How many yards of ſtuff, 3 qrs. broad, will line a cloke that is 5½ yards in length and 1¼ yard broad? *Anſ.* 9 yards, 0 qrs. 2 n. ⅔.

233. How many yards of matting, 2 feet 6 inches wide, will cover a floor that is 27 feet long and 20 feet broad? *Anſ.* 72 yards.

234. How many yards of carpeting, 3 qrs. broad, will cover a room which is 3 yards in length and 4 in breadth? *Anſ.* 16 yards.

PRACTICE

PRACTICE

IS a contraction of the Rule of Three Direct, when the firſt term happens to be an unit, and has its name from its daily uſe among thoſe concerned in trade; being an eaſy and conciſe method of working moſt queſtions that occur in buſineſs. An aliquot part of any number is that which being taken a certain number of times, does exactly make that number.

CASE I.

When the price is leſs than a penny, divide by the aliquot parts of a penny, and then by 12 and by 20, and it will give the anſwer required.

EXAMPLES.

3,456, at $\frac{1}{4}$? *Anſ.* £3 12*s.*
846, at $\frac{3}{4}$? *Anſ.* £2 12*s.* 10$\frac{1}{2}$*d.*
347, at $\frac{1}{2}$? *Anſ.* 14*s.* 5$\frac{1}{2}$*d.*
810, at $\frac{3}{4}$? *Anſ.* £2 10*s.* 7$\frac{1}{2}$*d.*

CASE II.

When the price is an aliquot part of a ſhilling, divide the given number by the aliquot part, and the quotient will be the anſwer in ſhillings, which reduce into pounds as before.

EXAMPLES.

437, at 1*d.*? *Anſ.* £1 16*s.* 5*d.*
5275, at 2*d.*? *Anſ.* £43 19*s.* 2*d.*
6771, at 4*d.*? *Anſ.* £112 17*s.*
352, at 1$\frac{1}{2}$*d.*? *Anſ* £2 4*s.*
1776, at 3*d*? *Anſ.* £22 4*s.*
899 at 6*d*? *Anſ.* £22 9*s.* 6*d.*

CASE III.

When the price is pence and farthings, and thoſe not an aliquot part of a ſhilling, divide the given number by ſome aliquot part of a ſhilling, and then conſider what part of the ſaid aliquot part the reſt of the price

is,

is, and divide the quotient thereby; add the ſeveral quotients together, and their ſum will be the anſwer in ſhillings, which reduce into pounds.

EXAMPLES.

372, at 1¾*d.*? *Anſ.* £2 14*s.* 3*d.*
827, at 4½*d.*? *Anſ.* £15 10*s.* 1½*d.*
2150, at 9¾*d.*? *Anſ.* 87 6*s.* 10½*d.*
325, at 2¼*d.*? *Anſ.* £3 0*s.* 11¼*d.*
2700, at 7¼*d*? *Anſ.* £81 11*s.* 3*d.*
1720, at 11½*d.*? *Anſ.* £82 8*s.* 4*d.*

CASE IV.

When the price is any even number of ſhillings under 20, multiply the given number by half of it, doubling the firſt figure to the right-hand for ſhillings, and the other figures are pounds.

When the price is an odd number, multiply the given quantity by the price, and divide by 20, the product will be the anſwer.

EXAMPLES.

2757, at 1*s.*? *Anſ.* £137 17*s.*
3275, at 5*s.*? *Anſ.* £818 15*s.*
372, at 11*s.*? *Anſ.* £204 12*s.*
3142, at 17*s.*? *Anſ.* £2670 14*s.*
2643, at 2*s.*? *Anſ.* £264 6*s.*
872, at 8*s.*? *Anſ.* £348 16*s.*
5271, at 14*s.*? *Anſ.* £3689 14*s.*
264, at 19*s.*? *Anſ.* £250 16*s.*

CASE V.

When the price is ſhillings and pence, which make ſome aliquot part of a pound, divide the given quantity by the aliquot part, and the quotient will be the anſwer in pounds.

EXAMPLES.

7150, at 1*s.* 8*d.*? *Anſ.* £595 16*s.* 8*d.*
3150, at 3*s.* 4*d.*? *Anſ.* £525.
2715, at 2*s.* 6*d.*? *Anſ.* £339 7*s.* 6*d.*
2710, at 6*s.* 8*d.*? *Anſ.* £903 6*s.* 8*d.*

CASE VI.

When the price is ſhillings and pence, which make no aliquot part of a pound, bring out the anſwer the ſhorteſt way that can be done, either by working for an even number of ſhillings and other aliquot parts; or by dividing the price into ſeveral parts, either of the given number, or of

of one another; but when this method would occaſion much work, it will be better to multiply the quantity by the ſhillings, and take parts for the pence, which added together will give the anſwer in ſhillings.

EXAMPLES.

7211, at 1*s.* 3*d.*? *Anſ.* £450 13*s.* 9*d.* 2710 at 3*s.* 2*d.*? *Anſ.* £429 1*s.* 8*d.*
801, at 10*s.* 9*d.*? *Anſ.* £430 10*s.* 9*d.* 841, at 13*s.* 2*d.*? *Anſ.* 553 13*s.* 2*d.*
807, at 16*s.* 5d.? *Anſ.* £662 8*s.* 3d. 969, at 19*s.* 11*d*? *Anſ.* £964 19*s.* 3*d.*

CASE VII.

When the price is ſhillings, pence, and farthings, divide the price into aliquot parts of a pound, or of one another, and the ſum of the quotients will be the anſwer.

EXAMPLES.

875, at 1*s.* 4¾*d.*? *Anſ.* £61 1*s.* 4¼*d.* 7524, at 3*s.* 5½*d.*? *Anſ.* £1301 0*s.* 6*d.*
3715, at 9*s.* 4½*d.*? *Anſ.* £1741 8*s.* 1½*d.* 2572, at 13*s.* 7½*d.*? *Anſ* £1752 3*s.* 6*d.*
1603, at 16*s.* 10½*d.*? *Anſ.* £1352 10*s.* 7½*d.* 2710, at 19*s.* 2½*d.*? £2602 14*s* 7*d.*

CASE VIII.

When the price is pounds, ſhillings, pence, and farthings, multiply the given number by the pounds, and work for the reſt the ſhorteſt way pointed out in the foregoing rules.

EXAMPLES.

137, at £1 17*s.* 6¼*d.*? *Anſ.* £257 0*s.* 4¼*d.*
947, at £4 15*s.* 10¾*d.*? *Anſ* £4538 13*s.* 10¾*d.*
457, at £14 17*s.* 9½*d.*? *Anſ.* £6804 10*s.* 9½*d.*

ARITHMETICAL TABLES.

TROY Weight.

4 grains make	1 carat
24 grains	1 penny weight
20 penny weights	1 ounce
12 ounces	1 pound

By this weight are weighed jewels, gold, ſilver, amber, electuaries, and all liquors.

N. B. 14 ounces, 11 penny weights, and 15½ grains troy, are equal to a pound avoirdupois.

AVOIRDUPOIS Weight.

16 drams make	1 ounce
16 ounces	1 pound
28 pounds	1 quarter
4 quarters	1 cwt.
20 hundred weight	1 ton

By this weight are weighed all things of a coarſe or droſſy nature; ſuch as butter, cheeſe, fleſh, bread, grocery-wares, and all metals except gold and ſilver.

APOTHECARIES Weight.

20 grains make	1 ſcruple
3 ſcruples	1 dram
8 drams	1 ounce
12 ounces	1 pound

Apothecaries uſe this weight in compounding their medicines, but they buy their drugs by avoirdupois weight.

The pound and ounce of the apothecaries, and the pound and ounce troy are the ſame, only differently divided and ſubdivided.

CLOTH Meaſure.

2¼ inches make	1 nail
4 nails	1 quarter
4 quarters	1 yard
3 quarters	1 ell Flemiſh
5 quarters	1 ell Engliſh
6 quarters	1 ell French

The yard is uſed in meaſuring all ſorts of woollen cloths, wrought ſilks, moſt linens, tapes, &c. The ell Engliſh is employed in meaſuring ſome particular linens, called hollands; and the ell Flemiſh in meaſuring tapeſtry.

LONG Meaſure.

3 barley corns in length make	1 inch
4 inches	1 hand's-breadth
12 inches	1 foot
3 feet	1 yard
6 feet	1 fathom
5½ yards	1 pole
40 poles	1 furlong
8 furlongs	1 mile
3 miles	1 league
60 geographical miles, or 69½ ſtatute miles	1 degree
360 degrees the circumference of the earth	

Long meaſure is uſed to meaſure the diſtance of places, or any thing elſe where length is conſidered without regard to breadth.

CUBIC Meaſure.

1728 cubic inches make	1 cubic foot
27 cubic feet	1 cubic yard

SQUARE or LAND Measure.

144 square inches make 1 square foot
9 square feet ..... 1 square yard
30¼ square yards ..... 1 square pole
40 square poles ..... 1 square rood
4 square roods ..... 1 square acre

Land measure is used to measure ground in order to find the contents in acres, &c.

DRY Measure.

2 pints make ..... 1 quart
2 quarts ..... 1 pottle
2 pottles ..... 1 gallon
2 gallons ..... 1 peck
4 pecks ..... 1 bushel
8 bushels ..... 1 quarter
5 quarters ..... 1 wey or load
4 bushels ..... 1 coomb
5 pecks (water measure) 1 bushel
10 coombs ..... 1 wey
2 weys ..... 1 last
36 bushels ..... 1 chaldron

By this measure, coal, salt, lead-ore, oysters, corn, seeds, fruits, roots, and other dry goods are measured.

WINE Measure.

2 pints make ..... 1 quart
10 gallons ..... 1 anker of brandy
4 quarts ..... 1 gallon
42 gallons ..... 1 tierce
63 gallons ..... 1 hogshead
84 gallons ..... 1 puncheon
2 hogsheads ..... 1 pipe or butt
2 pipes ..... 1 tun

By this measure brandies, spirits, perry, cyder, mead, vinegar, oil, and honey are measured. Milk is also retailed by this standard, not by law, but custom only.

ALE and BEER Measure.

2 pints make ..... 1 quart
4 quarts ..... 1 gallon
8 gallons ..... 1 firkin of ale
9 gallons ..... 1 firkin of beer
2 firkins ..... 1 kilderkin
2 kilderkins ..... 1 barrel
3 kilderkins ..... 1 hogshead
3 barrels ..... 1 butt

The ale gallon contains 282 cubic inches. In London the ale firkin contains 8 gallons, and the beer firkin 9, other measures being in the same proportion.

TIME.

60 seconds make ..... 1 minute
60 minutes ..... 1 hour
24 hours ..... 1 day
7 days ..... 1 week
4 weeks ..... 1 month
13 months, 1 day, and 6 hours, or 365 days and 6 hours, 1 year nearly.

A solar year, or one revolution of the earth about the sun, is 365 days, 5 hours, 48 minutes, 45½ seconds.

PRACTICE TABLE,

The aliquot Parts of a Pound.

s.	d.		
10	0	are the	half
6	8	.....	third
5	0	.....	fourth
4	0	.....	fifth
3	4	.....	sixth
2	6	.....	eighth
2	0	.....	tenth
1	8	.....	twelfth

The aliquot Parts of a Shilling.

d.		
6	are the	half
4	.....	third
3	.....	fourth
2	.....	sixth
1½	.....	eighth
1	is the	twelfth

The Weight of Current Coins as coined.

GOLD.

	dwts.	grs.
A guinea	5	9½
Half a guinea	2	16¾
Quarter ditto	1	8¼

The standard for gold coin is 22 carats of fine gold and 2 carats of copper melted together.

SILVER.

A crown	19	8½
Half ditto	9	16¼
A shilling	3	21
A sixpence	1	22½

The standard for silver is 11 ounces 2 pennyweights of fine silver and 18 pennyweights of copper.

WEIGHTS CURRENT.

A guinea	5	8
Half a guinea	2	16
Quarter ditto	1	8

A TABLE

Of the cuſtomary Weight of Goods.

	lbs.
A firkin of butter is	56
A firkin of ſoap	64
A barrel of pot aſhes	200
A barrel of anchovies	30
A barrel of candles	120
A barrel of ſoap	256
A barrel of butter	224
A fother of lead is 19 cwt. and a half	
A ſtone of iron	14
A ſtone of butcher's meat	8
A gallon of train oil	7½
A faggot of ſteel	120
A ſtone of glaſs	5
A ſeam of glaſs is 24 ſtone, or	120

WOOL Weight.

7 lbs. make	1 clove
2 cloves	1 ſtone
2 ſtones	1 tod
6½ tods	1 wey
2 weys	1 ſack
12 ſacks	1 laſt

BREAD.

	lb.	oz.	dr.
A peck loaf weighs	17	6	1
A half peck loaf	8	11	0
A quartern loaf	4	5	8

N. B. Avoirdupois.

HAY.

56 lbs. of old hay } make a truſs
60 lbs. of new hay }
36 truſſes make a load

COAL Meaſure.

4 pecks make	1 buſhel
9 buſhels	1 vat or ſtrike
36 buſhels	1 chaldron
21 chaldrons	1 ſcore

The NUMBER of DAYS in each MONTH.

Thirty days hath September,
April, June, and November;
February hath twenty-eight alone,
And all the reſt have thirty-one:
But leap-year coming once in four,
Doth give to February one day more.

F I N I S.